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## **Longmont Railroad Crossing Traffic Impact Study**

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### **Public Works & Natural Resources City of Longmont**



*Prepared for:*

**City of Longmont**

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# Contents

	Page No.
EXECUTIVE SUMMARY .....	1
1.0 INTRODUCTION.....	3
1.1 Context.....	3
1.2 Project Location .....	3
2.0 DATA COLLECTION.....	4
2.1 Traffic Data Collection.....	4
3.0 EXISTING CONDITIONS.....	4
3.1 Existing Geometry.....	4
3.1.1 3 <sup>rd</sup> Avenue/Main Street .....	4
3.1.2 2 <sup>nd</sup> Avenue/Main Street.....	4
3.1.3 1 <sup>st</sup> Avenue/Main Street.....	4
3.1.4 Boston Avenue/Main Street .....	5
3.1.5 1 <sup>st</sup> Avenue/Martin Street .....	5
3.1.6 Emery Street Railroad Crossing .....	5
3.1.7 Boston Avenue.....	5
3.1.8 3 <sup>rd</sup> Avenue.....	5
3.1.9 Ken Pratt Boulevard (SH 119) .....	6
3.2 Traffic Volumes and Operation .....	6
3.2.1 Traffic Volumes and Operations .....	6
4.0 PLANNED DEVELOPMENT .....	7
5.0 SCENARIOS .....	7
6.0 TRAFFIC FORECASTS .....	8
7.0 OPERATIONS ANALYSIS .....	12
7.1 Scenario 1: 2017 With Emery, No Boston.....	12
7.2 Scenario 2: 2017 No Emery, No Boston .....	13
7.3 Scenario 3: 2018 With Emery, No Boston.....	14
7.4 Scenario 4: 2018 No Emery, No Boston .....	14
7.5 Scenario 5: 2020 With Emery, No Boston.....	15
7.6 Scenario 6: 2020 No Emery, With Boston.....	16
7.7 Scenario 7: 2040 With Emery, No Boston.....	17
7.8 Scenario 8: 2040 No Emery, With Boston.....	17
8.0 SUMMARY AND RECOMMENDATIONS .....	18

## Appendices

Appendix A – Forecasting Methodology Memo

Appendix B – Synchro 9 LOS Output

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## EXECUTIVE SUMMARY

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### Context

The City of Longmont engaged Muller Engineering to conduct traffic analysis of two at-grade railroad crossing locations: Emery Street north of 1<sup>st</sup> Avenue and Boston Avenue west of Pratt Parkway. Emery Street is an existing at-grade crossing while Boston Avenue is a potential at-grade crossing location. The City has a desire for a new crossing at Boston Avenue in order to provide additional east/west connectivity as an alternative to 3<sup>rd</sup> Avenue or Ken Pratt Boulevard. The redevelopment of the 150 Main property (former Butterball Site), has triggered the need for improvement to the existing Emery Street at-grade crossing.

The estimated costs to improve the existing Emery Street crossing exceed the amount of funding available for the project. Therefore, staff requested an evaluation of the impacts to traffic operations in the area if the Emery Street crossing was to be closed. The task of this analysis is to evaluate the benefits of the crossings along Emery Street and Boston Avenue.

### Scenarios

The City of Longmont requested several scenarios be analyzed to assess the utility of the existing Emery Street at-grade crossing compared to a potential Boston Avenue at-grade crossing. The scenarios cover multiple forecast years and varying crossing conditions on Emery Street and Boston Avenue. Each scenario was analyzed for both the AM and PM peak hours. The scenarios are discussed in detail in the report.

### Operations Analysis

AM and PM peak hour traffic operations were analyzed for each of the identified scenarios using Synchro 9 traffic analysis software. For the five study intersections, average delay per vehicle, intersection level of service (LOS) and the maximum volume to capacity ratio (v/c) for the worst performing movement were calculated. In addition, for the 2040 conditions where a Boston Avenue railroad crossing is provided, peak hour and daily volume analysis on Ken Pratt Boulevard, 3<sup>rd</sup> Avenue and Boston Avenue was conducted in order to estimate benefits to parallel corridors by providing the Boston Avenue crossing location.

### Summary and Recommendations

The analysis of the Emery Street and Boston Avenue railroad crossings demonstrates that both crossings provide a level of utility to the Longmont Roadway network. In general, the Emery Street crossing helps to distribute traffic on 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Avenues, while providing a north-south connection parallel to Main Street. In addition, the crossing provides a pedestrian and bicycle connection parallel to Main Street.

The Boston Avenue crossing provides another east/west cross city connection as an alternative to 3<sup>rd</sup> Avenue or Ken Pratt Boulevard. Based on the analysis of eight scenarios for the years 2017, 2018, 2020 and 2040, each crossing location provides localized traffic improvements.

### **Maintain Emery Street Crossing**

- Improves traffic operations at the 2<sup>nd</sup> Avenue/Main Street and 1<sup>st</sup> Avenue/Martin Street intersections.
- Provides a pedestrian and bicycle connection parallel to Main Street, which will ultimately be extended south to Boston Avenue.
- Emery Street crossing closure increases traffic volumes on 2<sup>nd</sup> Avenue at Main Street. Drivers would utilize Main Street to cross the railroad corridor under this scenario. The traffic volumes on 2<sup>nd</sup> Avenue increase to a point that 2<sup>nd</sup> Avenue operates over capacity at Main Street.

Given that closing the Emery Street crossing degrades the existing roadway network and creates a barrier for pedestrian and bicyclists it is recommended that the Emery Street crossing be maintained.

### **Open Boston Avenue Crossing**

- Improves traffic operations at the 3<sup>rd</sup> Avenue/Main Street and 1<sup>st</sup> Avenue/Main Street intersections resulting from re-routing of existing traffic to use new at-grade crossing.
- Shifts some traffic from 3<sup>rd</sup> Avenue to the Boston Avenue corridor and provide localized operational improvements.

# 1.0 INTRODUCTION

## 1.1 Context

The City of Longmont engaged Muller Engineering to conduct traffic analysis of two at-grade railroad crossing locations: Emery Street north of 1<sup>st</sup> Avenue and Boston Avenue west of Pratt Parkway. Emery Street is an existing at-grade crossing while Boston Avenue is a potential at-grade crossing location. The City has a desire for a new crossing at Boston Avenue in order to provide additional east/west connectivity as an alternative to 3<sup>rd</sup> Avenue or Ken Pratt Boulevard. The redevelopment of the 150 Main property (former Butterball Site), has triggered the need for improvement to the existing Emery Street at-grade crossing.

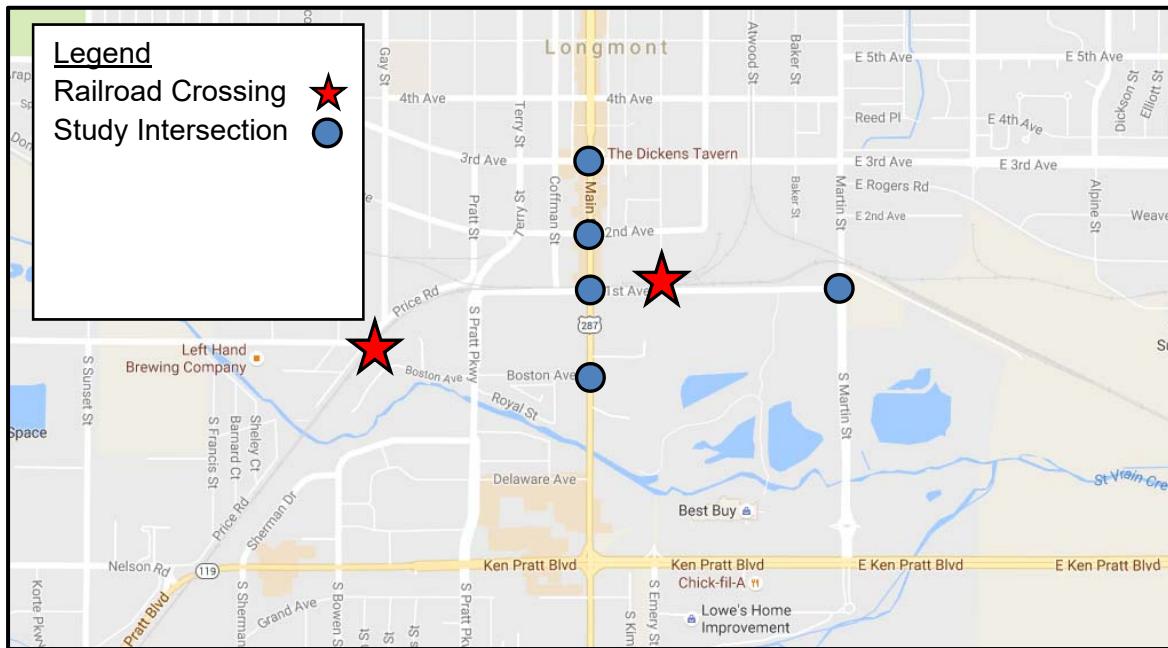
The estimated costs to improve the existing Emery Street crossing exceed the amount of funding available for the project. Therefore, staff requested an evaluation of the impacts to traffic operations in the area if the Emery Street crossing was to be closed. The task of this analysis is to determine the benefits of each crossing.

## 1.2 Project Location

The project study area includes five study intersections within downtown Longmont: 3<sup>rd</sup> Avenue/Main Street (US 287), 2<sup>nd</sup> Avenue/Main St, 1<sup>st</sup> Avenue/Main Street, Boston Avenue/Main Street and 1<sup>st</sup> Avenue/Martin Street. In addition, the analysis will assess the impacts of the railroad crossings on the 3<sup>rd</sup> Avenue and Ken Pratt Boulevard (SH 119) corridors, which are parallel to Boston Avenue.

The study area is shown in Figure 1.1.

Figure 1.1: Study Area



Source: Google Maps, © Google 2016.

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## 2.0 DATA COLLECTION

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### 2.1 Traffic Data Collection

Multiple data sources were used to develop existing conditions for the study area. Traffic counts were not conducted for the analysis, rather, recent traffic studies in the area were used to acquire peak hour turning movement volumes. The *First & Main Traffic Impact Study* (FHU, 2014) was used to establish existing traffic volumes (2014) for the study intersections on 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Avenues. Traffic volumes (2015) at Boston Avenue/Main Street were acquired from the *US Highway 287/Boston Avenue Signal Warrant Analysis Report* (Longmont, 2015).

Synchro files with existing traffic signal timings were acquired from the *Longmont Roadway Plan* (Muller, 2014). The synchro files were for the AM and PM peak hours for the entire Longmont roadway network. The synchro files were edited to cover just the project study area. No additional data was collected as part of the project.

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## 3.0 EXISTING CONDITIONS

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### 3.1 Existing Geometry

The following sections describe the existing intersection geometry at each study intersection. Existing geometry is anticipated to be maintained through the horizon year 2040, unless otherwise noted in following sections of the report.

#### 3.1.1 3<sup>rd</sup> Avenue/Main Street

The 3<sup>rd</sup> Avenue/Main Street intersection is a signalized intersection in downtown Longmont. Both Main Street and 3<sup>rd</sup> Avenue provide two through lanes in each direction. A single dedicated left turn lane is also provided in each direction. The left turns are operated using protected/permissive phasing. Right turns are conducted from the outside through lanes on each approach.

#### 3.1.2 2<sup>nd</sup> Avenue/Main Street

The 2<sup>nd</sup> Avenue/Main Street intersection is a signalized intersection in downtown Longmont. Main Street provides two through lanes in the northbound and southbound directions. 2<sup>nd</sup> Avenue a single through lane in the eastbound and westbound directions. A single dedicated left turn lane is also provided in each direction. The left turns are operated using only permissive phasing. Right turns are conducted from the outside through lanes on each approach with the exception of the eastbound direction, which provides a dedicated right turn lane.

#### 3.1.3 1<sup>st</sup> Avenue/Main Street

The 1<sup>st</sup> Avenue/Main Street intersection is a signalized intersection. Main Street provides two through lanes in the northbound and southbound directions. 1<sup>st</sup> Avenue provides a single

through lane in the eastbound and westbound directions. A single dedicated left turn lane is also provided in each direction, with the exception of southbound Main Street, where left turns are conducted from the inside through lane. The northbound and westbound left turns are operated using protected/permissive phasing. All other left turns are permissive only. Right turns are conducted from the outside through lanes on each approach.

### **3.1.4 Boston Avenue/Main Street**

The Boston Avenue/Main Street intersection is an unsignalized intersection. The intersection is currently being realigned from two t-intersections to a single four-legged intersection. In the new configuration Main Street will provide two through lanes in the northbound and southbound directions. Boston Avenue will provide a single through lane in each direction. A single dedicated left turn lane will also be provided in each direction. Right turns are conducted from the outside through lanes on each approach. The new intersection will remain unsignalized until traffic volumes meet traffic signal warrants.

### **3.1.5 1<sup>st</sup> Avenue/Martin Street**

The 1<sup>st</sup> Avenue/Martin Street intersection is an unsignalized intersection. Martin Street provides a single through lane in the northbound and southbound directions. 1<sup>st</sup> Avenue provides a single through lane in the eastbound and westbound directions. A dedicated left turn lane is provided in the northbound direction and a dedicated right turn lane is provided in the southbound direction. All other turning movements are conducted from the adjacent through lanes.

### **3.1.6 Emery Street Railroad Crossing**

Emery Street provides an at-grade crossing of three railroad tracks just north of 1<sup>st</sup> Avenue. The existing crossing is stop controlled, with a single lane in each direction on Emery Street. The crossing currently serves vehicles, pedestrians and bicycles. If maintained, this crossing location will become signalized in the future.

### **3.1.7 Boston Avenue**

Boston Avenue is a two-lane collector roadway that travels east-west across the city of Longmont. In the study area Boston Avenue stretches approximately ½ mile from the railroad corridor east to Main Street. There are plans to extend the Boston Avenue corridor one-half mile east to Martin Street. West of the railroad corridor, Boston Avenue extends approximately 2.5 miles west to Airport Road. Boston Avenue is currently discontinuous at the railroad corridor since no at-grade crossing is provided.

### **3.1.8 3<sup>rd</sup> Avenue**

The 3<sup>rd</sup> Avenue corridor is located approximately one-half mile north of the Boston Avenue. East of downtown Longmont, 3<sup>rd</sup> Avenue provides two through lanes in each direction. West of downtown, a single through lane is provided in each direction. The roadway provides approximately 3.5 miles of connectivity across the City of Longmont between Hover Avenue and Ken Pratt Boulevard (SH 119).

### 3.1.9 Ken Pratt Boulevard (SH 119)

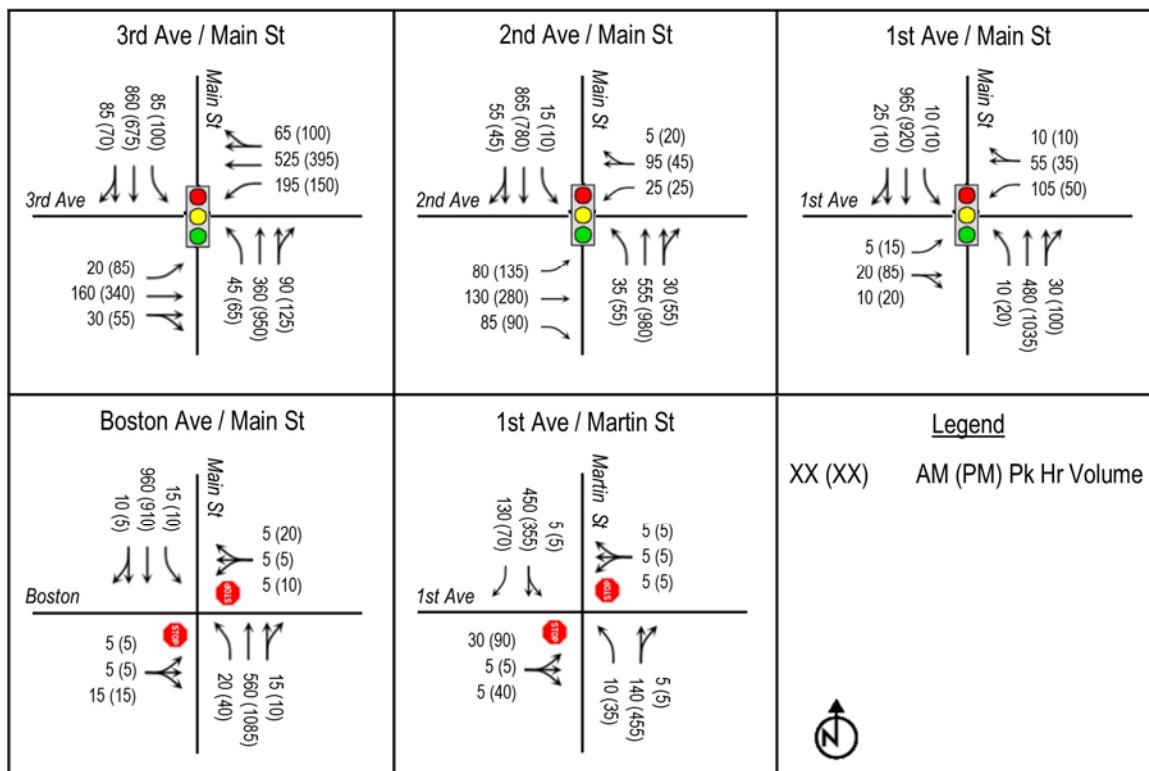
Ken Pratt Boulevard is the primary arterial that provides mobility across the south side of the City of Longmont. SH 119 provides access to the City of Boulder to the southwest and I-25 to the east. The roadway typically provides two through lanes in each direction with a short portion between Main Street and Martin Street provided three lanes in each direction. Ken Pratt Boulevard is located approximately one-half mile south of Boston Avenue.

## 3.2 Traffic Volumes and Operation

### 3.2.1 Traffic Volumes and Operations

Existing AM and PM peak hour volumes were acquired from recent traffic analysis reports in the study area. The *First & Main Traffic Impact Study* (FHU, 2014) presented 2014 peak hour traffic counts at the study intersections on 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Avenues. The *US Highway 287/Boston Avenue Signal Warrant Analysis Report* (Longmont, 2015) presented 2015 peak hour traffic counts at the Boston Avenue/Main Street intersection. The existing volumes used to establish intersection operations are presented in Figure 3.1. Table 3.1 shows delay, level of service (LOS) and maximum volume to capacity ratio for the AM and PM peak hours. All intersections currently operate at LOS D or better.

Figure 3.1: Existing Traffic Volumes



Sources: *First & Main Traffic Impact Study* (FHU, 2014), *US Highway 287/Boston Avenue Signal Warrant Analysis Report* (Longmont, 2015)

**Table 3.1: Existing Traffic Operations**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	Max V/C	Delay	LOS	Max V/C
3 <sup>rd</sup> Ave/Main St	24	C	0.73	30	C	0.71
2 <sup>nd</sup> Ave/Main St	13	B	0.62	12	B	0.78
1 <sup>st</sup> Ave/Main St	11	B	0.67	11	B	0.58
Boston Ave/Main St <sup>1</sup>	19	C	0.08	31	D	0.16
1 <sup>st</sup> Ave/Martin St <sup>1</sup>	16	C	0.12	33	D	0.54

Source: Muller Engineering Company, 2016

Notes:

1. *Unsignalized intersection – Delay and LOS are for worst performing stop-controlled approach*
2. *Delay is the average value (seconds). V/C is the volume to capacity ratio. V/C for intersection is the maximum V/C from the critical movements.*

## 4.0 PLANNED DEVELOPMENT

Approximately two blocks of land adjacent to the Emery Street railroad crossing is proposed for re-development, which has been named the “150 Main” project. The redevelopment area includes the area bounded by Main Street to the west, 2<sup>nd</sup> Avenue to the north, 1<sup>st</sup> Avenue to the south and Collyer Street to the east. The development is planned to take place in two phases. Phase one is planned to include approximately 330 residential apartments, 7,000 square feet of office space and 3,500 square feet of retail space. Phase two is planned to include approximately 175 residential apartments. The trip generation and forecast trip assignment for the two phases of development are presented in the *First & Main Traffic Impact Study* (FHU, 2014).

In addition to the planned development, the City of Longmont has planned roadway improvements within the study area. The improvements include the extension of Boston Avenue east from Main Street to Martin Street. In addition, Emery Street is planned to be extended south from 1<sup>st</sup> Street to the new extension of Boston Avenue. The extension of both streets would include the extension of bicycle and pedestrian facilities.

## 5.0 SCENARIOS

The City of Longmont requested eight scenarios be analyzed to assess the utility of the existing Emery Street at-grade crossing and a potential Boston Avenue at-grade crossing. The scenarios cover multiple forecast years and varying crossing conditions on Emery Street and Boston Avenue. Each scenario will be analyzed for both the AM and PM peak hours. The eight identified scenarios are:

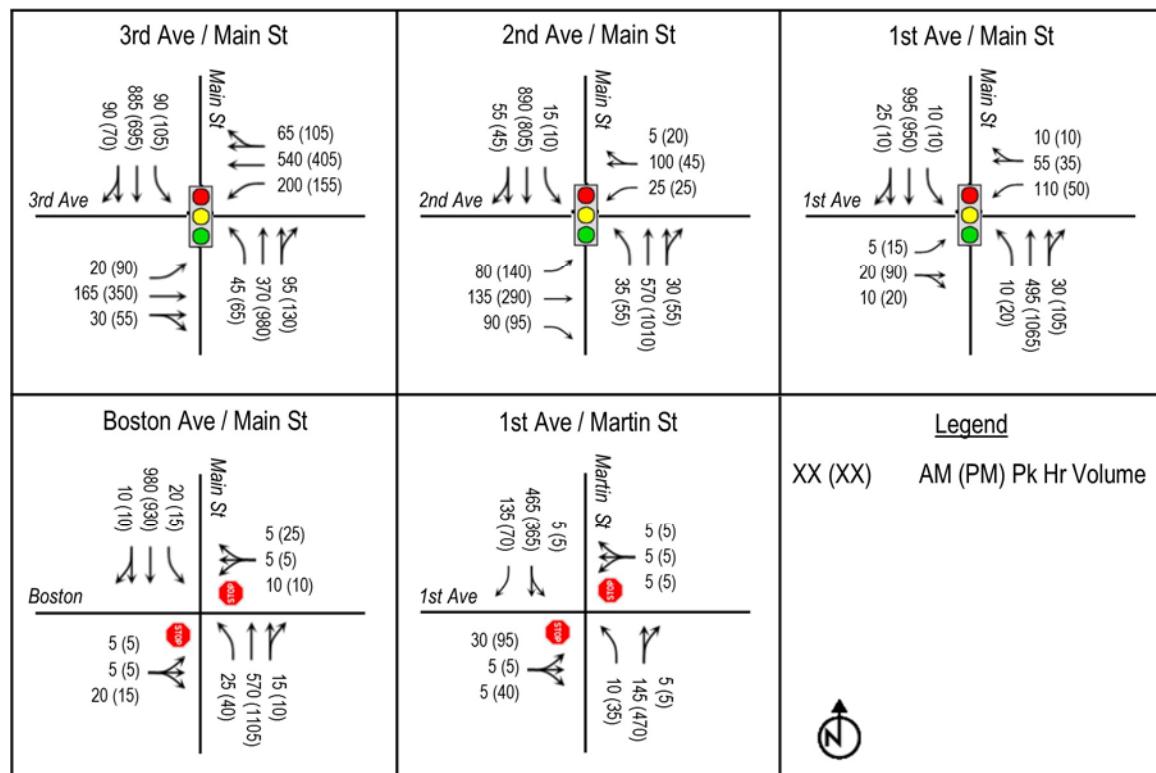
1. 2017 Baseline Volumes, With Emery Crossing, Without Boston Crossing
2. 2017 Baseline Volumes, Without Emery Crossing, Without Boston Crossing

3. 2018 Volumes (2017 Baseline plus 150 Main Phase 1), With Emery Crossing, Without Boston Crossing
4. 2018 Volumes, Without Emery Crossing, Without Boston Crossing
5. 2020 Volumes (2017 Baseline plus 150 Main Buildout), with Emery Crossing, Without Boston Crossing
6. 2020 Volumes, Without Emery Crossing, With Boston Crossing
7. 2040 Volumes, With Emery Crossing, Without Boston Crossing
8. 2040 Volumes, Without Emery Crossing, With Boston Crossing

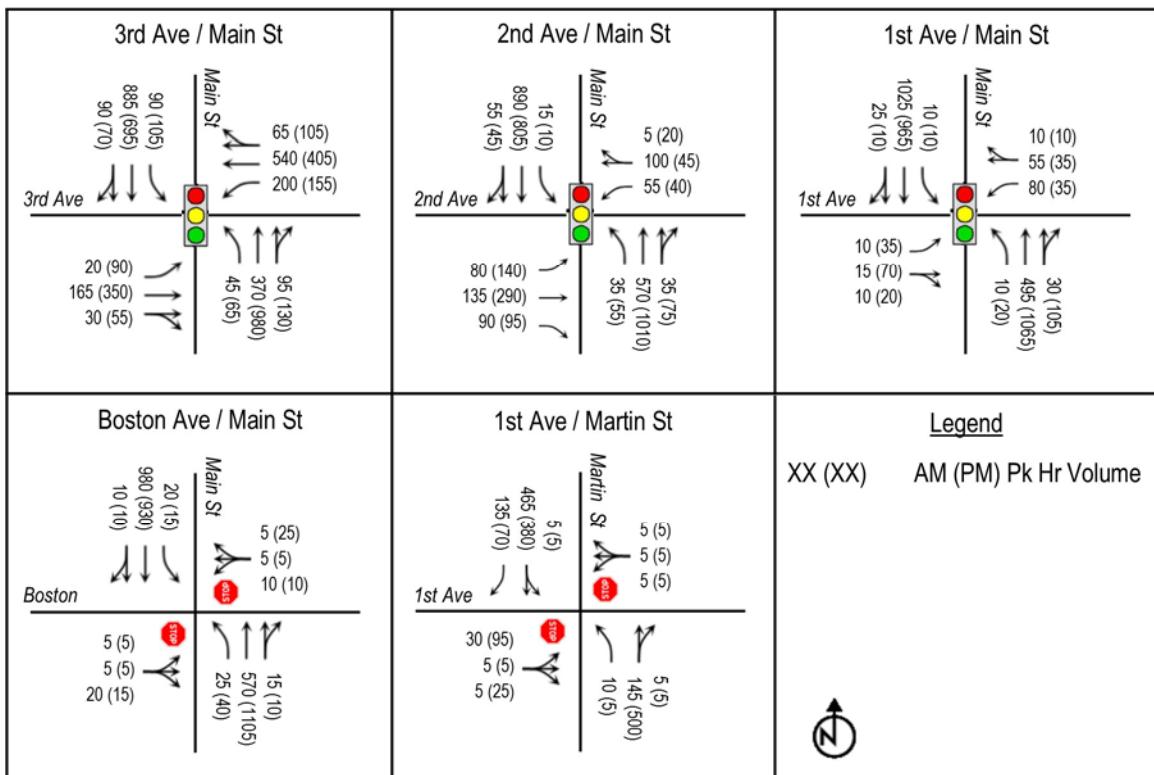
## 6.0 TRAFFIC FORECASTS

Traffic forecasts were developed for each of the identified horizon years and roadway scenarios. The forecasting methodology is documented in the *Analysis Scenario Forecasts Memorandum* (Muller, July 5, 2016). The memo is provided in Appendix A. In general, traffic counts from previous studies along with trip generation forecasts for the 150 Main development were used to generate the future year forecasts. The *Longmont Roadway Plan* was used to estimate long term traffic growth through the year 2040. Figures 6.1 through 6.8 document the resulting traffic forecasts for each scenario.

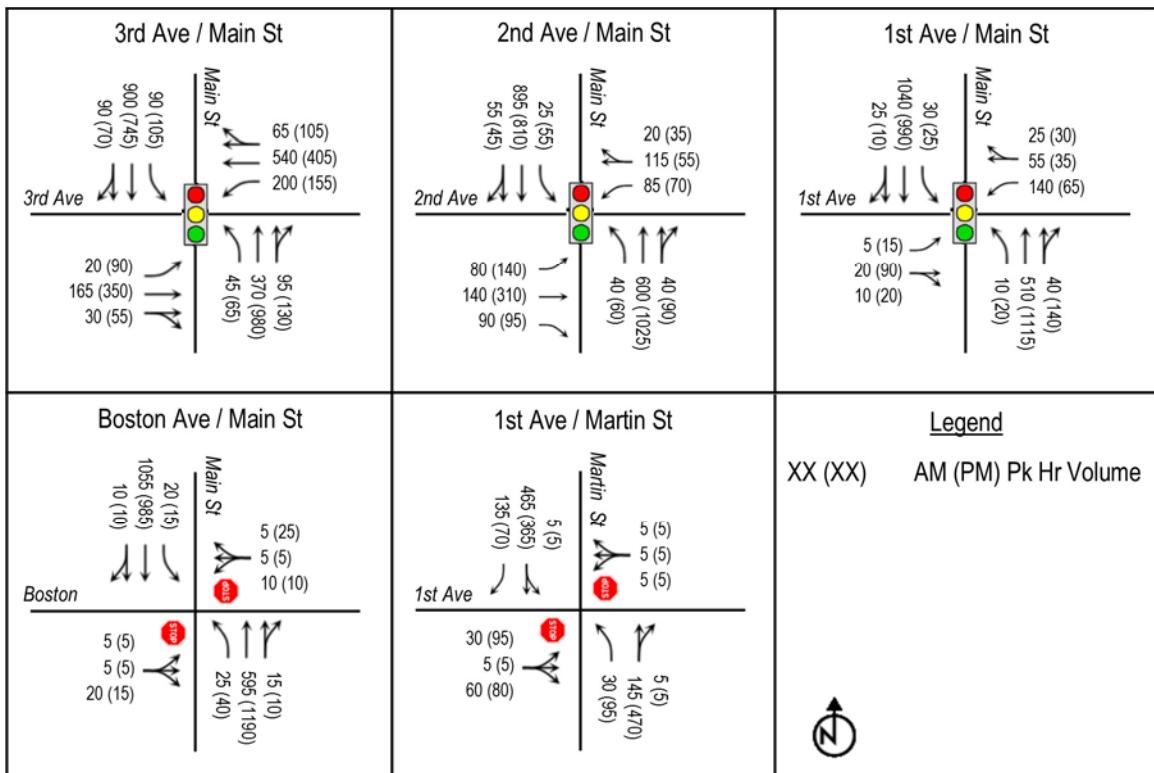
**Figure 6.1: Scenario 1 – 2017 Peak Hour Volumes**



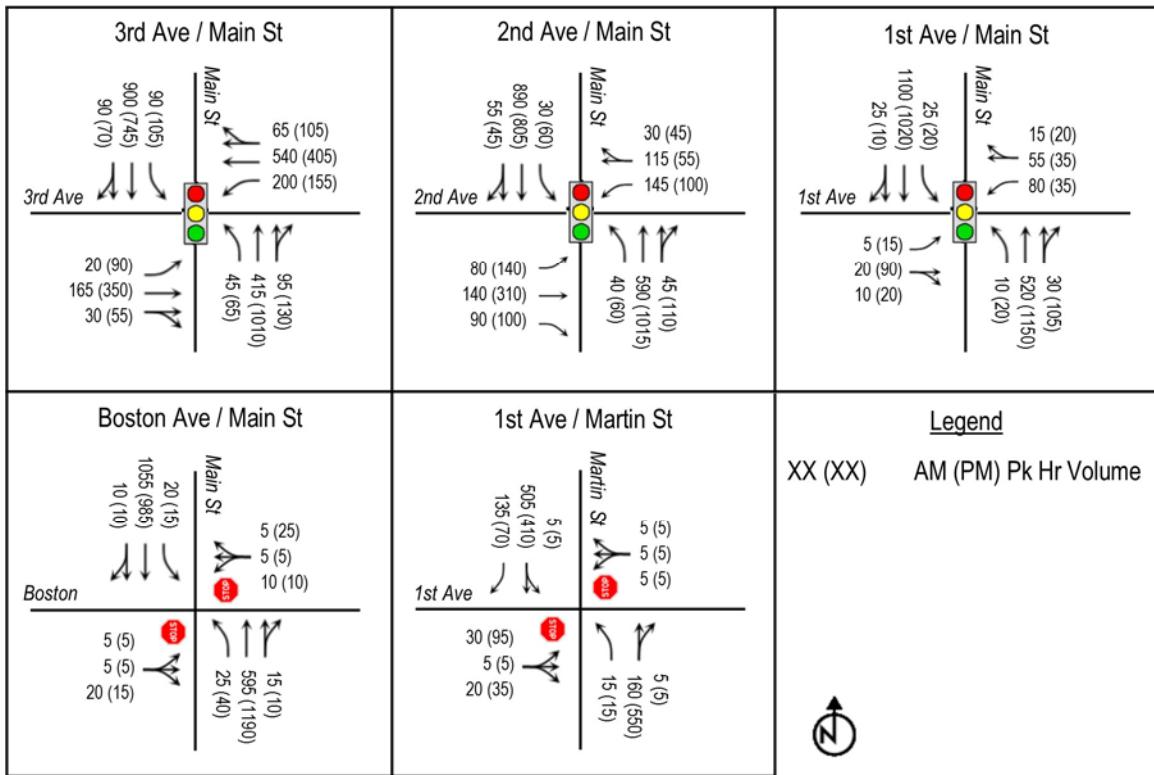
**Figure 6.2: Scenario 2 – 2017 Peak Hour Volumes**



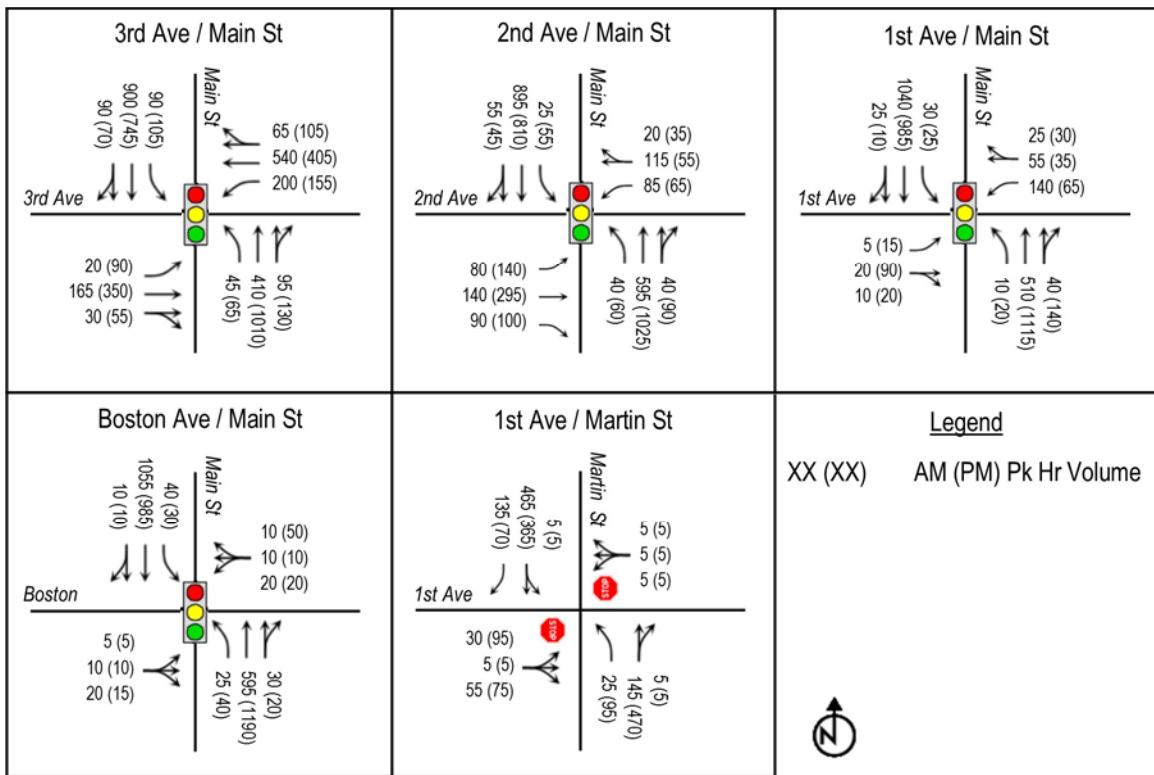
**Figure 6.3: Scenario 3 – 2018 Peak Hour Volumes**



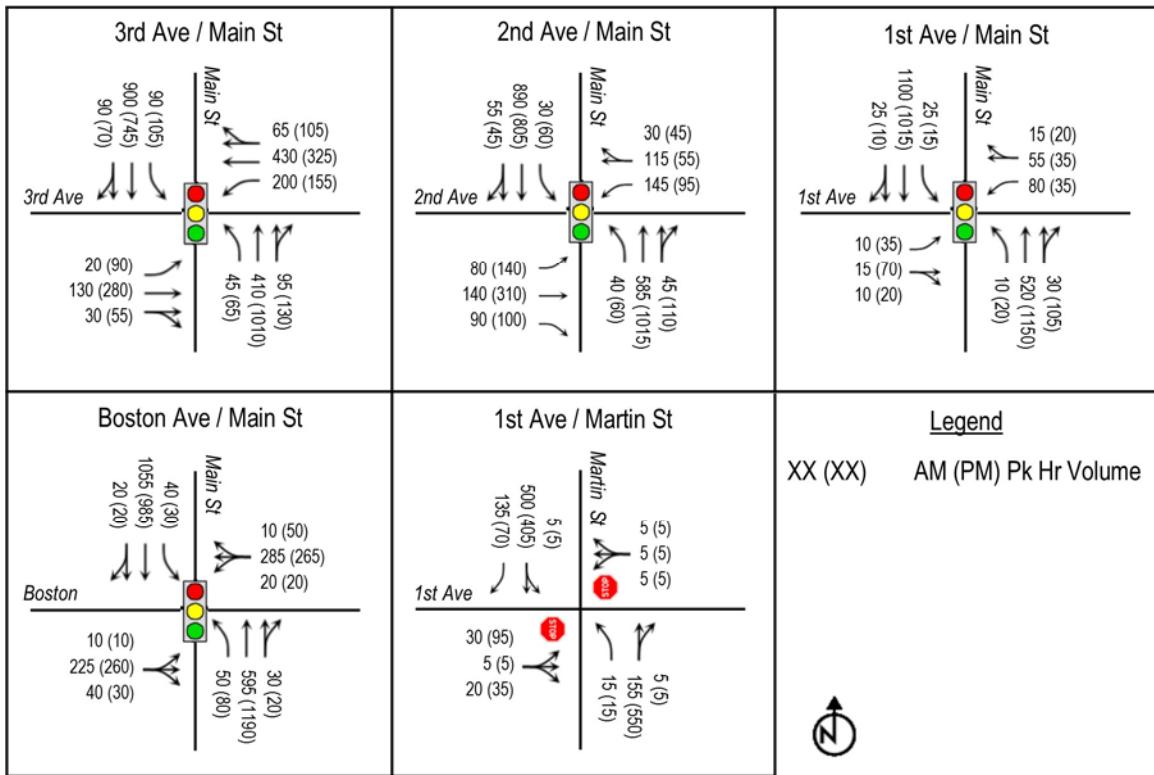
**Figure 6.4: Scenario 4 – 2018 Peak Hour Volumes**



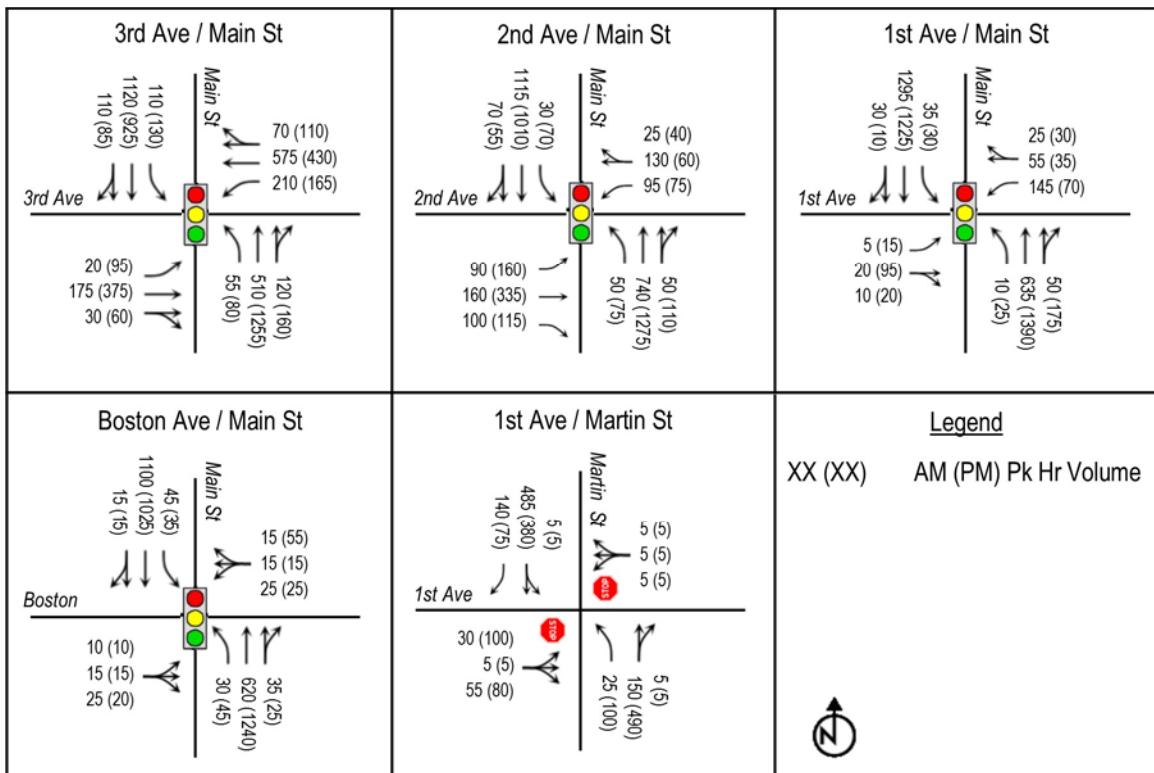
**Figure 6.5: Scenario 5 – 2020 Peak Hour Volumes**



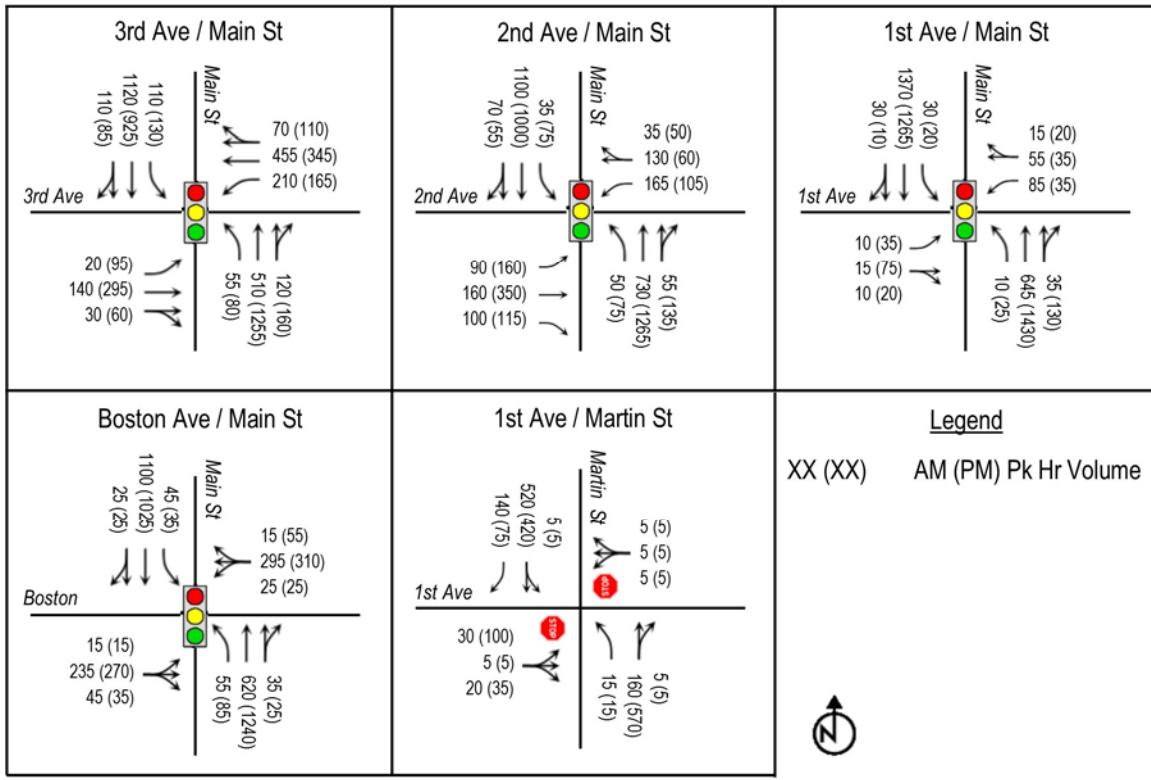
**Figure 6.6: Scenario 6 – 2020 Peak Hour Volumes**



**Figure 6.7: Scenario 7 – 2040 Peak Hour Volumes**



**Figure 6.8: Scenario 8 – 2040 Peak Hour Volumes**



## 7.0 OPERATIONS ANALYSIS

AM and PM peak hour traffic operations were analyzed for each of the identified scenarios using Synchro 9 traffic analysis software. For the five study intersections, average delay per vehicle, intersection level of service (LOS) and the maximum volume to capacity ratio (v/c) for the worst performing movement were calculated. In addition, for the 2040 conditions where a Boston Avenue railroad crossing is provided, peak hour and daily volume analysis on Ken Pratt Boulevard, 3<sup>rd</sup> Avenue and Boston Avenue was conducted in order to estimate benefits to parallel corridors by providing the Boston Avenue crossing location. All operations analysis assumed existing 100 second peak hour traffic signal cycle lengths, offsets and signal phasing were maintained through 2040. The future traffic signal at Boston Avenue/Main Street was assumed to be coordinated with the remainder of the Main Street corridor.

### 7.1 Scenario 1: 2017 With Emery, No Boston

Scenario 1 assumed 2017 baseline volumes with the existing roadway network. The at-grade crossing on Emery Street was maintained. The 2017 baseline volumes assumed traffic volume prior to the completion of phase one of the 150 Main Development.

The traffic analysis indicates that during the AM peak hour all of the study intersections operate at LOS D or better. During the PM peak hour the three signalized intersections operate at LOS C or better. The two unsignalized intersections show degraded operations. The 1<sup>st</sup> Avenue/Martin Street intersection operates at LOS E. The Boston Avenue/Main Street intersection operates at LOS F. In both cases the eastbound left turn movement is the controlling movement during the PM peak hour.

**Table 7.1: Scenario 1: 2017 Traffic Operations**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	Max V/C	Delay	LOS	Max V/C
3 <sup>rd</sup> Ave/Main St	24	C	0.74	31	C	0.74
2 <sup>nd</sup> Ave/Main St	12	B	0.64	13	B	0.79
1 <sup>st</sup> Ave/Main St	14	B	0.70	11	B	0.60
Boston Ave/Main St <sup>1</sup>	30	D	0.19	87	F	0.52
1 <sup>st</sup> Ave/Martin St <sup>1</sup>	16	C	0.12	36	E	0.58

Source: Muller Engineering Company, 2016

Notes:

1. *Unsignalized intersection – Delay and LOS are for worst performing stop-controlled approach*
2. *Delay is the average value (seconds). V/C is the volume to capacity ratio. V/C for intersection is the maximum V/C from the critical movements.*

## 7.2 Scenario 2: 2017 No Emery, No Boston

Scenario 2 assumed 2017 baseline volumes with the existing roadway network except that the Emery Street at-grade crossing would be closed. The closure of the crossing would include the closure to pedestrians and bicycles as well as vehicles. A grade separated pedestrian and bicycle crossing is not proposed. The 2017 volumes assumed traffic currently using Emery Street would divert to Main Street or Martin Street. The traffic conditions were assumed to be prior to the completion of phase one of the 150 Main Development.

The traffic analysis indicates that during the AM peak hour all of the study intersections operate at LOS D or better with the exception of the Boston Avenue/Main Street intersection which operates at LOS E. During the PM peak hour the three signalized intersections operate at LOS C or better. The two unsignalized intersections show degraded operations. The 1<sup>st</sup> Avenue/Martin Street intersection operates at LOS D. The Boston Avenue/Main Street intersection operates at LOS F. In both cases the eastbound left turn movement is the controlling movement during the PM peak hour.

**Table 7.2: Scenario 2: 2017 Traffic Operations**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	Max V/C	Delay	LOS	Max V/C
3rd Ave/Main St	24	C	0.74	32	C	0.74
2nd Ave/Main St	13	B	0.64	13	B	0.79
1st Ave/Main St	12	B	0.52	9	A	0.54
Boston Ave/Main St <sup>1</sup>	42	E	0.19	87	F	0.52
1st Ave/Martin St <sup>1</sup>	17	C	0.12	35	D	0.54

Source: Muller Engineering Company, 2016

Notes:

1. *Unsignalized intersection – Delay and LOS are for worst performing stop-controlled approach*
2. *Delay is the average value (seconds). V/C is the volume to capacity ratio. V/C for intersection is the maximum V/C from the critical movements.*

### 7.3 Scenario 3: 2018 With Emery, No Boston

Scenario 3 assumed 2017 baseline volumes plus phase one of the 150 Main development. The analysis assumed the existing roadway network with the existing Emery Street at-grade crossing.

The traffic analysis indicates that during the AM peak hour all of the study intersections are forecast to operate at LOS C or better with the exception of the Boston Avenue/Main Street intersection which operates at LOS E. During the PM peak hour the three signalized intersections are forecast to operate at LOS C or better. The two unsignalized intersections are forecast to operate at LOS F. In both cases the eastbound left turn movement is the controlling movement during the PM peak hour.

**Table 7.3: Scenario 3: 2018 Traffic Operations**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	Max V/C	Delay	LOS	Max V/C
3rd Ave/Main St	24	C	0.74	32	C	0.76
2nd Ave/Main St	16	B	0.75	15	B	0.81
1st Ave/Main St	17	B	0.88	11	B	0.60
Boston Ave/Main St <sup>1</sup>	49	E	0.22	135	F	0.67
1st Ave/Martin St <sup>1</sup>	16	C	0.24	61	F	0.80

Source: Muller Engineering Company, 2016

Notes:

1. *Unsignalized intersection – Delay and LOS are for worst performing stop-controlled approach*
2. *Delay is the average value (seconds). V/C is the volume to capacity ratio. V/C for intersection is the maximum V/C from the critical movements.*

### 7.4 Scenario 4: 2018 No Emery, No Boston

Scenario 4 assumed 2017 baseline volumes plus phase one of the 150 Main development. The analysis assumed the existing roadway network except that the Emery Street at-grade crossing

would be closed. The closure of the crossing would include the closure to pedestrians and bicycles as well as vehicles. A grade separated pedestrian and bicycle crossing is not proposed. Trip generation assignment for the 150 Main developed was modified to account for the closure of the Emery Street railroad crossing.

The traffic analysis indicates that during the AM peak hour all of the study intersections are forecast to operate at LOS D or better with the exception of the Boston Avenue/Main Street intersection which operates at LOS E. During the PM peak hour the three signalized intersections are forecast to operate at LOS C or better. The two unsignalized intersections show degraded operations. The 1<sup>st</sup> Avenue/ Martin Street intersection operates at LOS E. The Boston Avenue/Main Street intersection operates at LOS F. In both cases the eastbound left turn movement is the controlling movement during the PM peak hour. During both peak hours the 2<sup>nd</sup> Avenue/Main Street intersection experiences a v/c ratio over 1.0 for the westbound left turn. This is a result of traffic diverting to 2<sup>nd</sup> Avenue with the closure of the Emery Street crossing.

**Table 7.4: Scenario 4: 2018 Traffic Operations**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	Max V/C	Delay	LOS	Max V/C
3 <sup>rd</sup> Ave/Main St	24	C	0.74	32	C	0.76
2 <sup>nd</sup> Ave/Main St	21	C	1.06	17	B	1.03
1 <sup>st</sup> Ave/Main St	14	B	0.55	10	A	0.54
Boston Ave/Main St <sup>1</sup>	49	E	0.22	135	F	0.67
1 <sup>st</sup> Ave/Martin St <sup>1</sup>	17	C	0.17	47	E	0.66

Source: Muller Engineering Company, 2016

Notes:

1. *Unsignalized intersection – Delay and LOS are for worst performing stop-controlled approach*
2. *Delay is the average value (seconds). V/C is the volume to capacity ratio. V/C for intersection is the maximum V/C from the critical movements.*

## 7.5 Scenario 5: 2020 With Emery, No Boston

Scenario 5 assumed 2017 baseline volumes plus the buildout of the 150 Main development. The analysis assumed the existing roadway network with the addition of a traffic signal at the Boston Avenue/Main Street intersection. It was also assumed that Boston Avenue was extended to connect between Main Street and Martin Street.

The traffic analysis indicates that during the AM peak hour all of the study intersections operate at LOS C or better. The traffic signal at Boston Avenue improves the intersection's operations to LOS A. During the PM peak hour the four signalized intersections operate at LOS C or better. The unsignalized intersection at 1<sup>st</sup> Avenue/ Martin Street intersection operates at LOS F. The eastbound left turn movement is the controlling movement during the PM peak hour.

**Table 7.5: Scenario 5: 2020 Traffic Operations**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	Max V/C	Delay	LOS	Max V/C
3 <sup>rd</sup> Ave/Main St	24	C	0.74	34	C	0.76
2 <sup>nd</sup> Ave/Main St	16	B	0.75	20	C	0.80
1 <sup>st</sup> Ave/Main St	17	B	0.88	18	B	0.60
Boston Ave/Main St	2	A	0.37	3	A	0.43
1 <sup>st</sup> Ave/Martin St <sup>1</sup>	16	C	0.22	<b>60</b>	<b>F</b>	0.79

Source: Muller Engineering Company, 2016

Notes:

1. *Unsignalized intersection – Delay and LOS are for worst performing stop-controlled approach*
2. *Delay is the average value (seconds). V/C is the volume to capacity ratio. V/C for intersection is the maximum V/C from the critical movements.*

## 7.6 Scenario 6: 2020 No Emery, With Boston

Scenario 6 assumed 2017 baseline volumes plus the buildout of the 150 Main development. The analysis assumed the existing roadway network with the closure of the Emery Street at-grade crossing and the construction of an at-grade crossing on Boston Avenue. In addition a traffic signal at the Boston Avenue/Main Street intersection was assumed. It was also assumed that Boston Avenue was extended to connect between Main Street and Martin Street.

The traffic analysis indicates that during the AM peak hour all of the study intersections are forecast to operate at LOS C or better. During the PM peak hour the four signalized intersections are forecast to operate at LOS C or better. The 1<sup>st</sup> Avenue/ Martin Street intersection operates at LOS E. The eastbound left turn movement is the controlling movement during the PM peak hour. During both peak hours the 2<sup>nd</sup> Avenue/Main Street intersection experiences a v/c ratio over 1.0 for the westbound left turn. This is a result of traffic diverting to 2<sup>nd</sup> Avenue with the closure of the Emery Street crossing.

**Table 7.6: Scenario 6: 2020 Traffic Operations**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	Max V/C	Delay	LOS	Max V/C
3 <sup>rd</sup> Ave/Main St	22	C	0.79	29	C	0.74
2 <sup>nd</sup> Ave/Main St	21	C	<b>1.06</b>	17	B	<b>1.02</b>
1 <sup>st</sup> Ave/Main St	14	B	0.55	9	A	0.54
Boston Ave/Main St	18	B	0.89	19	B	<b>0.93</b>
1 <sup>st</sup> Ave/Martin St <sup>1</sup>	17	C	0.17	<b>46</b>	<b>E</b>	0.65

Source: Muller Engineering Company, 2016

Notes:

1. *Unsignalized intersection – Delay and LOS are for worst performing stop-controlled approach*
2. *Delay is the average value (seconds). V/C is the volume to capacity ratio. V/C for intersection is the maximum V/C from the critical movements.*

## 7.7 Scenario 7: 2040 With Emery, No Boston

Scenario 7 utilized 2040 forecasts for the study area. The analysis assumed the existing roadway network with the addition of a traffic signal at the Boston Avenue/Main Street intersection. It was also assumed that Boston Avenue was extended to connect between Main Street and Martin Street.

The traffic analysis indicates that during the AM peak hour all of the study intersections operate at LOS C or better. The traffic signal at Boston Avenue improves the intersection's operations to LOS A. During the PM peak hour the four signalized intersections operate at LOS D or better. The unsignalized intersection at 1<sup>st</sup> Avenue/ Martin Street intersection operates at LOS F. The eastbound left turn movement is the controlling movement during the PM peak hour.

**Table 7.7: Scenario 7: 2040 Traffic Operations**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	Max V/C	Delay	LOS	Max V/C
3 <sup>rd</sup> Ave/Main St	25	C	0.76	39	D	<b>0.97</b>
2 <sup>nd</sup> Ave/Main St	16	B	0.87	16	B	<b>0.94</b>
1 <sup>st</sup> Ave/Main St	17	B	<b>0.98</b>	14	B	0.78
Boston Ave/Main St	3	A	0.39	3	A	0.46
1 <sup>st</sup> Ave/Martin St <sup>1</sup>	16	C	0.23	<b>82</b>	<b>F</b>	<b>0.90</b>

Source: Muller Engineering Company, 2016

Notes:

1. *Unsignalized intersection – Delay and LOS are for worst performing stop-controlled approach*
2. *Delay is the average value (seconds). V/C is the volume to capacity ratio. V/C for intersection is the maximum V/C from the critical movements.*

## 7.8 Scenario 8: 2040 No Emery, With Boston

Scenario 8 utilized 2040 forecasts for the study area. The analysis assumed the existing roadway network with the closure of the Emery Street at-grade crossing and the construction of an at-grade crossing on Boston Avenue. In addition a traffic signal at the Boston Avenue/Main Street intersection was assumed. It was also assumed that Boston Avenue was extended to connect between Main Street and Martin Street.

The traffic analysis indicates that during the AM peak hour all of the study intersections are forecast to operate at LOS C or better. During the PM peak hour the four signalized intersections are forecast to operate at LOS C or better. The 1<sup>st</sup> Avenue/ Martin Street intersection operates at LOS F. The eastbound left turn movement is the controlling movement during the PM peak hour. During both peak hours the 2<sup>nd</sup> Avenue/Main Street intersection experiences a v/c ratio over 1.0 for the westbound left turn. This is a result of traffic diverting to 2<sup>nd</sup> Avenue with the closure of the Emery Street crossing.

**Table 7.8: Scenario 8: 2040 Traffic Operations**

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	Max V/C	Delay	LOS	Max V/C
3 <sup>rd</sup> Ave/Main St	23	C	0.82	35	C	<b>0.94</b>
2 <sup>nd</sup> Ave/Main St	28	C	<b>1.37</b>	19	B	<b>1.16</b>
1 <sup>st</sup> Ave/Main St	13	B	0.68	11	B	0.74
Boston Ave/Main St	19	B	<b>0.92</b>	18	B	<b>0.90</b>
1 <sup>st</sup> Ave/Martin St <sup>1</sup>	17	C	0.17	<b>56</b>	<b>F</b>	0.72

Source: Muller Engineering Company, 2016

Notes:

1. *Unsignalized intersection – Delay and LOS are for worst performing stop-controlled approach*
2. *Delay is the average value (seconds). V/C is the volume to capacity ratio. V/C for intersection is the maximum V/C from the critical movements.*

In addition to intersection operations analysis, corridor volume analysis was conducted on Ken Pratt Boulevard and 3<sup>rd</sup> Avenue to assess the impact on corridor parallel to Boston Avenue. With the at-grade railroad crossing providing cross-city connectivity on Boston Avenue, it would anticipated that traffic using Ken Pratt Boulevard or 3<sup>rd</sup> Avenue would re-route to Boston Avenue.

Based on long-term travel demand model runs, the daily traffic forecast for Boston Avenue with the at-grade rail crossing is approximately 5,000 vehicles per day. During the peak hours approximately 400 to 500 vehicles would be anticipated to use the Boston Avenue corridor. The forecast daily volume on 3<sup>rd</sup> Avenue decreases from 7,000 vehicles per day to 5,800 vehicles per day. This equates to a reduction of 100 to 200 vehicles during the peak hours. Daily volumes on Ken Pratt Boulevard are not forecast to be impacted by the Boston Avenue crossing. This is likely due to the fact that Ken Pratt Boulevard is a major regional connector and any traffic which moves to Boston Avenue would likely be replaced with other drivers wishing to use the congested corridor.

## 8.0 SUMMARY AND RECOMMENDATIONS

The analysis of the Emery Street and Boston Avenue railroad crossings demonstrates that both crossings provide a level of utility to the Longmont Roadway network. In general, the Emery Street crossing helps to distribute traffic on 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Avenues, while providing a north-south connection parallel to Main Street. In addition, the crossing provides a pedestrian and bicycle connection parallel to Main Street. The Boston Avenue crossing provides another east/west cross city connection as an alternative to 3<sup>rd</sup> Avenue or Ken Pratt Boulevard. Based on the analysis of eight scenarios for the years 2017, 2018, 2020 and 2040, each crossing location provides localized traffic improvements.

## 8.1 Maintain Emery Street Crossing

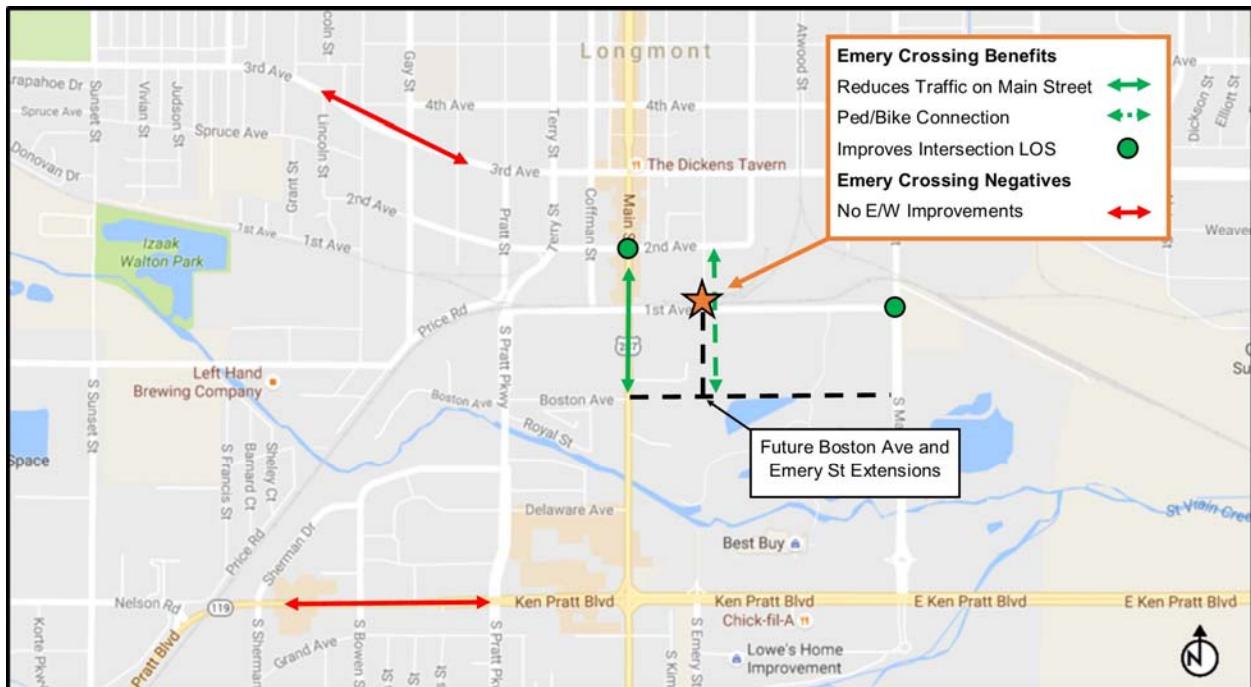
- Improves traffic operations at the 2<sup>nd</sup> Avenue/Main Street and 1<sup>st</sup> Avenue/Martin Street intersections.
  - Provides a pedestrian and bicycle connection parallel to Main Street, which will ultimately be extended south to Boston Avenue.
  - A closure of the Emery Street crossing increases traffic volumes on 2<sup>nd</sup> Avenue at Main Street. Drivers would utilize Main Street to cross the railroad corridor under this scenario. The traffic volumes on 2<sup>nd</sup> Avenue increase to a point that 2<sup>nd</sup> Avenue operates over capacity at Main Street.
  - An Emery Street closure would close pedestrian and bicycle connections since a grade-separated crossing would be required without the at-grade street crossing. A grade-separated structure is currently not planned to accommodate pedestrians and bicycles.

## 8.2 Open Boston Avenue Crossing

- Improves traffic operations at the 3<sup>rd</sup> Avenue/Main Street and 1<sup>st</sup> Avenue/Main Street intersections resulting from re-routing of existing traffic to use new at-grade crossing.
  - Shifts some traffic from 3<sup>rd</sup> Avenue to the Boston Avenue corridor and provide localized operational improvements.

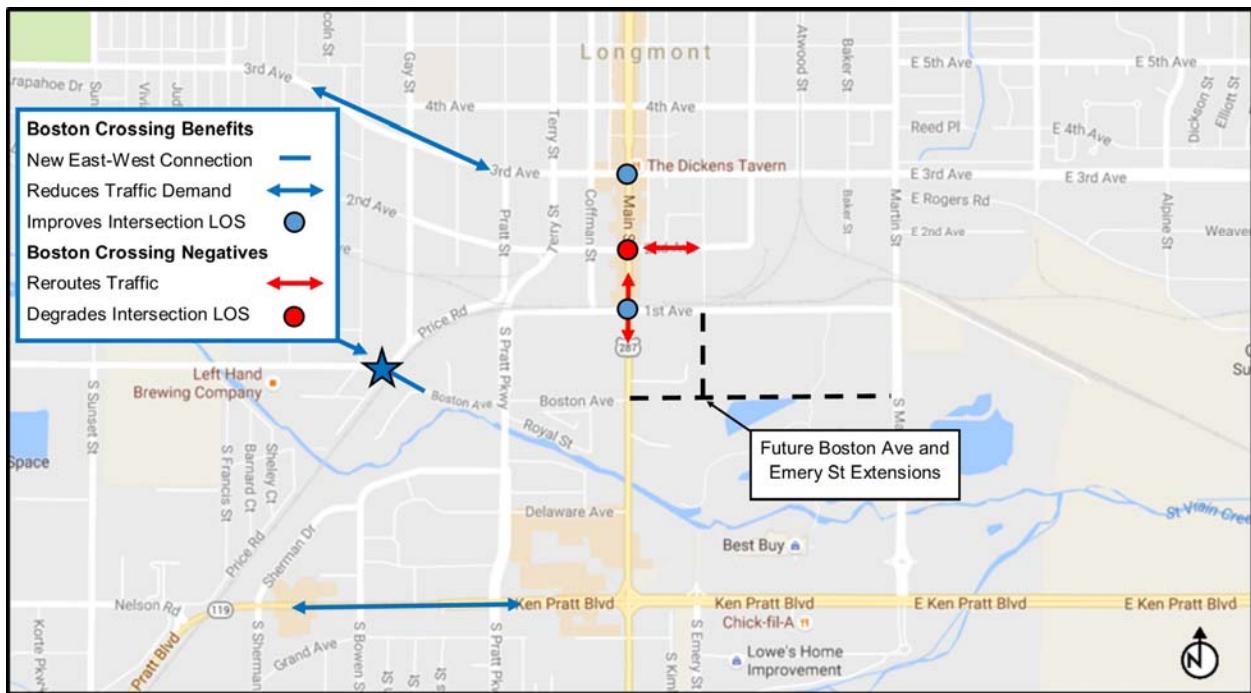
A summary of the benefits of the Emery Street and Boston Street crossing locations are presented in Figures 8.1 and 8.2 respectively.

**Figure 8.1: Emery Crossing Summary**



Source: Muller Engineering Company, 2016

**Figure 8.2: Boston Crossing Summary**



Given that closing the Emery Street crossing degrades the existing roadway network and creates a barrier for pedestrian and bicyclists it is recommended that the Emery Street crossing be maintained.

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## APPENDICES

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Appendix A Forecasting Methodology Memo

## MEMORANDUM

**Project:** Longmont Railroad Crossing Traffic Impact Study  
**To:** Bob Ball, PE – City of Longmont  
Tyler Stamey, PE – City of Longmont  
**From:** John Hausman, PE, PTOE – Muller Engineering Company  
**Date:** July 5, 2016  
**Subject:** Analysis Scenario Forecasts

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This memorandum summarizes the traffic forecasting methodology used to generate traffic forecasts for the eight identified scenarios for the Longmont Railroad Crossing Traffic Impact Study. The memo will summarize the assumptions and steps taken to develop the traffic forecasts for each scenario. Attached to this memo are hand-drawn traffic forecasts for each scenario, as well as accompanying exhibits showing how previously generated forecasts were manipulated depending on each scenario.

### **ANALYSIS SCENARIOS**

Eight scenarios were identified for analysis as part of the Longmont Railroad Crossing Traffic Impact Study.

- 2017 with Emery Street crossing
- 2017 without Emery Street crossing
- 2018 with Emery Street crossing, plus 150 Main development traffic
- 2018 without Emery Street Crossing, plus 150 Main development traffic
- 2020 with Emery Street crossing, plus development full buildout
- 2020 without Emery Street crossing, with Boston Avenue crossing, plus development full buildout
- 2040 with Emery Street crossing, without Boston Avenue crossing
- 2040 without Emery Street crossing, with Boston Avenue crossing

Each scenario was forecast for both the AM and PM peak hours. Forecasts were developed for five study intersections: Main Street/3<sup>rd</sup> Avenue, Main Street/2<sup>nd</sup> Avenue, Main Street/1<sup>st</sup> Avenue, Main Street/Boston Avenue and Martin Street/1<sup>st</sup> Avenue. In addition, forecasts were developed for the Emery Street/1<sup>st</sup> Avenue intersection during the forecasting process.

The forecasting process also estimated the volume impacts of the proposed Boston Avenue railroad crossing on volumes on 3<sup>rd</sup> Avenue, Boston Avenue and Ken Pratt Boulevard.

### **DATA SOURCES**

Multiple data sources were used to develop the future year traffic forecasts for each scenario. The DRCOG regional travel demand model was not used in the forecasting process.



The *Longmont Roadway Plan (2014)* and associated Synchro analysis files were used to estimate the average traffic growth rates between the analyzed years of 2010 and 2035. In addition, the scenarios presented in the plan were used to estimate the amount of traffic that could possibly re-route to Boston Avenue if an at-grade railroad crossing is provided.

The *First & Main Traffic Impact Study (2014)* was used as the source of peak hour turning movement counts at the four study intersections on 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Avenues. In addition, the study documented the forecast trip generation for the proposed two-phase development at 150 Main Street.

The counts conducted for the Boston Avenue/Main Street traffic signal warrant study were used to provide existing AM and PM peak hour turning movements for the re-aligned Boston Avenue/Main Street intersection.

## **METHODOLOGY**

The multiple data sources were used to develop AM and PM peak hour traffic forecasts for each of the identified scenarios. Existing volumes (pages 1 and 2 of attachment) were considered to be the 2014 traffic counts on 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Avenues and the 2015 traffic counts on Boston Avenue.

The “2017 with Emery” forecasts (page 3) were developed by increasing the traffic counts by one percent annually. As a result, counts taken in 2014 were increased over three years. Counts in 2015 were increased over two years. The “2017 without Emery” forecasts (page 4) were developed by manually adjusting the 2017 with Emery forecasts to remove the Emery Street railroad crossing connection, which is located just north of 1<sup>st</sup> Avenue. The volumes using the railroad crossing were manually reassigned to the remaining roadway network.

The “2018 with Emery + 150 Main” forecasts (page 6) were developed by adding the Phase 1 forecast traffic from the 150 Main development (page 7) to the 2017 with Emery forecasts. The “2018 without Emery” forecasts (page 8) were developed by adding the Phase 1 forecast traffic from the 150 main development adjusted to account for the removal of the Emery Street railroad crossing (page 9) to the 2017 without Emery forecasts.

The “2020 with Emery, No Boston” forecasts (page 10) were developed by adding the trip generation for the full 150 Main development (page 11) to the 2017 with Emery forecasts. In addition, Boston Avenue was assumed to provide a connection between Main Street and Martin Street. The 2017 turning movements to/from the east leg of the intersection were assumed to double in volume with the connection to Martin Street.

The “2020 without Emery, with Boston” forecasts (Page 12) were developed by adding the trip generation for the full 150 Main development (page 13) to the 2017 without Emery forecasts. The 150 Main trip generation was adjusted to account for the removal of the Emery Street railroad crossing. In addition to the assumption that Boston Avenue was connected between Main Street and Martin Street, a new railroad crossing on Boston Avenue approximate two miles west of Main Street was assumed. This connection was assumed in one of the future scenarios presented in the *Longmont Roadway Plan*. The plan forecast a daily traffic forecast of approximately 3,000 vehicles per day on Boston Avenue in the vicinity of Main Street. During the peak hours, it was estimated that approximately 200 vehicles in each

direction would shift from Ken Pratt Boulevard to Boston Avenue. In addition, approximately 20 percent of traffic on 3<sup>rd</sup> Avenue would shift to Boston Avenue. Turning movements at the Boston Avenue/Main Street intersection were assumed to double compared to 2017 traffic conditions.

The “2040 with Emery, no Boston” (page 14) and “2040 without Emery, with Boston” (page 15) forecasts were developed using average annual growth rates derived from the *Longmont Roadway Plan*. The plan was used to develop average growth rates between the years 2010 and 2035 for Main Street, 1<sup>st</sup> Avenue, 2<sup>nd</sup> Avenue, 3<sup>rd</sup> Avenue and Boston Avenue. These growth rates were then applied to the peak hour turning movement volumes. The following are the calculated average growth rates.

- 3<sup>rd</sup> Avenue – 0.3% per year
- 2<sup>nd</sup> Avenue – 0.6% per year
- 1<sup>st</sup> Avenue – 0.2% per year
- Boston Avenue – 0.2% per year
- Main Street – 1.1% per year

### **NEXT STEPS**

The resulting turning movement forecasts will be analyzed in Synchro 9 software to identify the pros and cons of each proposed scenario. The analysis results will be used to inform the decision making process in regards to at-grade railroad crossings provided in the City of Longmont.

**TURNING MOVEMENT FORECASTS**

P61

Muller Engineering Company, Inc.  
DESIGN NOTES AND COMPUTATIONS

BOSTON  
UPDATED

Subject: LONGMONT EXISTING VOLUMES (2014)

Sheet No. \_\_\_\_\_ Of \_\_\_\_\_

Prepared By: \_\_\_\_\_ Checked By: \_\_\_\_\_ Date: \_\_\_\_\_ Project No.: \_\_\_\_\_

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P62

Muller Engineering Company, Inc.  
**DESIGN NOTES AND COMPUTATIONS**

BOSTON  
UPDATED

Subject: Longmont Existing Volumes (2014)

Sheet No. \_\_\_\_\_ Of \_\_\_\_\_

Prepared By: \_\_\_\_\_ Checked By: \_\_\_\_\_ Date: \_\_\_\_\_ Project No.: \_\_\_\_\_

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PG 3

Muller Engineering Company, Inc.  
DESIGN NOTES AND COMPUTATIONS

BOSTON  
UPDATED

Subject: LONGMONT 2017 w/EMERY

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Prepared By: \_\_\_\_\_

Checked By: \_\_\_\_\_

Date: \_\_\_\_\_

Project No.: \_\_\_\_\_

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FROM 2014.

BOSTON GROWNS 1%, ANNUALLY FROM  
2015

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P64

Muller Engineering Company, Inc.  
**DESIGN NOTES AND COMPUTATIONS**

BOSTON  
UPDATED

Subject: LONGMONT 2017 W/OUT EMERY

Sheet No. \_\_\_\_\_ Of \_\_\_\_\_

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Date: \_\_\_\_\_

Project No.: \_\_\_\_\_

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200	<p>15(10) L</p> <p>55(45) L</p> <p>50(140) —</p> <p>135(250) —</p> <p>90(95) —</p> <p>10(10) L</p> <p>105(905) L</p> <p>25(10) L</p>	<p>35(75) — 570(1010) — 35(55)</p> <p>715 — 55(35) — 80(35)</p>
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**ACCOMPANIES 2017 W/OUT EMERY**  
**Muller Engineering Company, Inc.**  
**DESIGN NOTES AND COMPUTATIONS**

Subject: LONGMONT 2017 W/EMERY

Sheet No. \_\_\_\_\_ of \_\_\_\_\_

Prepared By: \_\_\_\_\_ Checked By: \_\_\_\_\_ Date: \_\_\_\_\_ Project No.: \_\_\_\_\_

Am(Lpm)

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TO REMOVE EMERY  
VOLUMES**

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PG 60

Muller Engineering Company, Inc.  
DESIGN NOTES AND COMPUTATIONS

BOSTON  
UPDATED

Subject: LONGMONT 2019 W/ EMERY + 150 MAIN

Sheet No. \_\_\_\_\_ Of \_\_\_\_\_

Prepared By: \_\_\_\_\_

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$$\begin{array}{l} L \ 45(95) \\ - 70(45) \\ \hline R \ 45(60) \end{array}$$

$$\begin{array}{l} L \ 20(90) \\ - 160(80) \\ \hline R \ 40(70) \end{array}$$

$$\begin{array}{l} L \ 30(75) \\ - 5(5) \\ \hline R \ 25(45) \\ - 5(5) \\ \hline L \ 5(5) \\ - 30(15) \end{array}$$

BOSTON

$$\begin{array}{l} L \ 5(25) \\ - 5(5) \\ \hline R \ 10(10) \end{array}$$

$$\begin{array}{l} L \ 15(10) \\ - 5(5) \\ \hline R \ 15(40) \end{array}$$

P67

ACCOMPANIES 2018 W/EMERY + 150 MAIN

- SHOWS ASSIGNMENT OF 150 MAIN TRAFFIC

PHASE 1

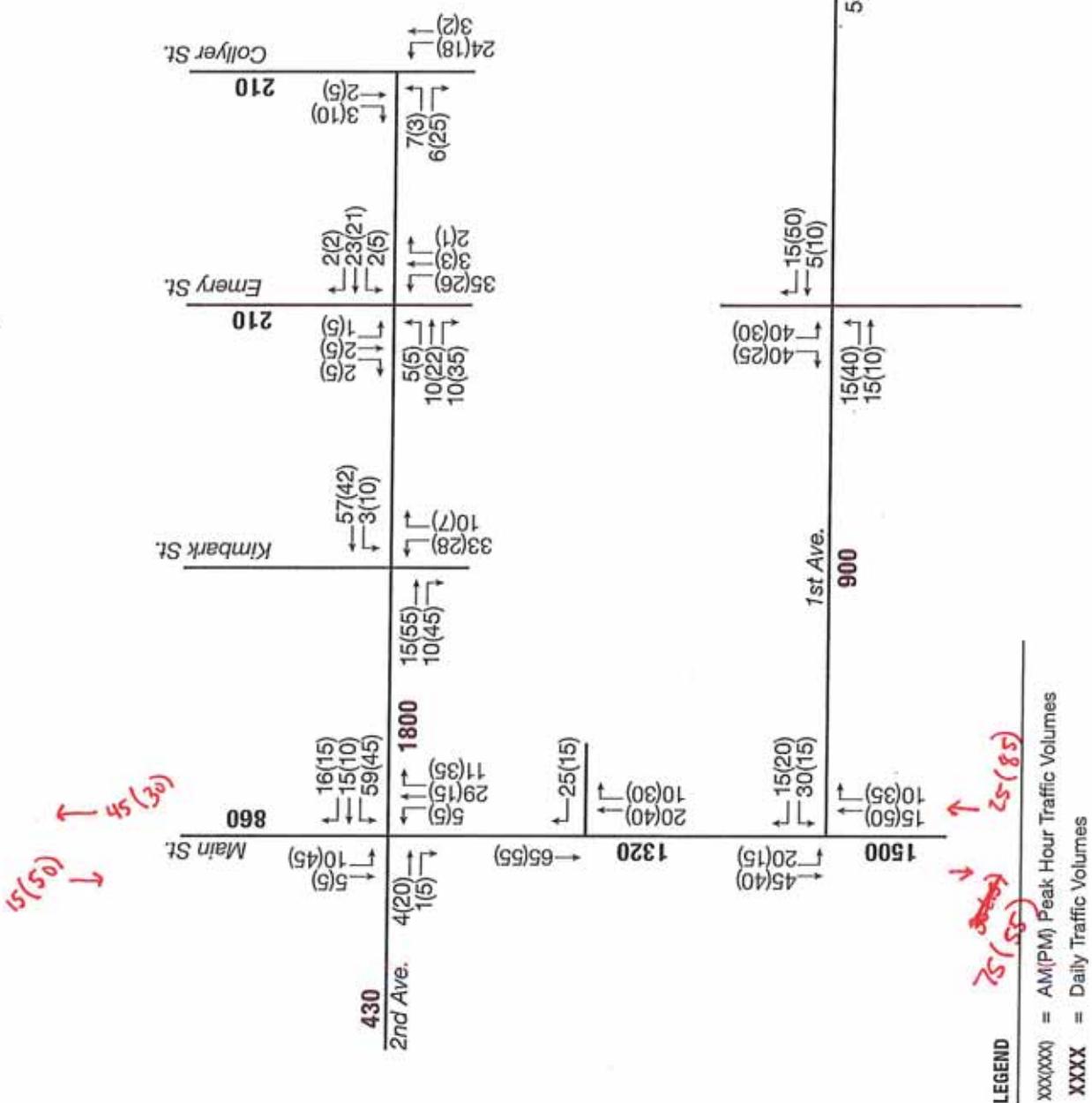


Figure 5  
Short Range Future  
Site Generated Traffic Assignment

P68

Muller Engineering Company, Inc.  
DESIGN NOTES AND COMPUTATIONS

BOSTON  
UPDATED

Subject: LONGMONT 2018 W/OUT EMERY

Sheet No. \_\_\_\_\_ Of \_\_\_\_\_

Prepared By: \_\_\_\_\_

Checked By: \_\_\_\_\_

Date: \_\_\_\_\_

Project No.: \_\_\_\_\_

AM(PM)

300

$20(90)$	$\sqcap$	$71\Gamma$
$165(350)$	$\sqcap$	$95(130)$
$30(55)$	$\sqcap$	$45(100)$

2ND

$80(140)$	$\sqcap$	$71\Gamma$
$140(310)$	$\sqcap$	$50(110)$
$90(100)$	$\sqcap$	$45(105)$
$25(50)$	$\sqcap$	$15(20)$
$100(100)$	$\sqcap$	$55(35)$
$25(50)$	$\sqcap$	$80(35)$

1ST

$10(35)$	$\sqcap$	$71\Gamma$
$15(70)$	$\sqcap$	$30(105)$
$10(20)$	$\sqcap$	$520(150)$
$10(20)$	$\sqcap$	$10(20)$
$10(20)$	$\sqcap$	$5(25)$
$10(20)$	$\sqcap$	$5(25)$
$10(20)$	$\sqcap$	$10(40)$

BOSTON

$5(5)$	$\sqcap$
$5(5)$	$\sqcap$
$20(15)$	$\sqcap$

$71\Gamma$
$595(1190)$
$25(40)$

2017 VOLUMES

PLUS

PHASE 1 SITE (GENERATED)

MAIN

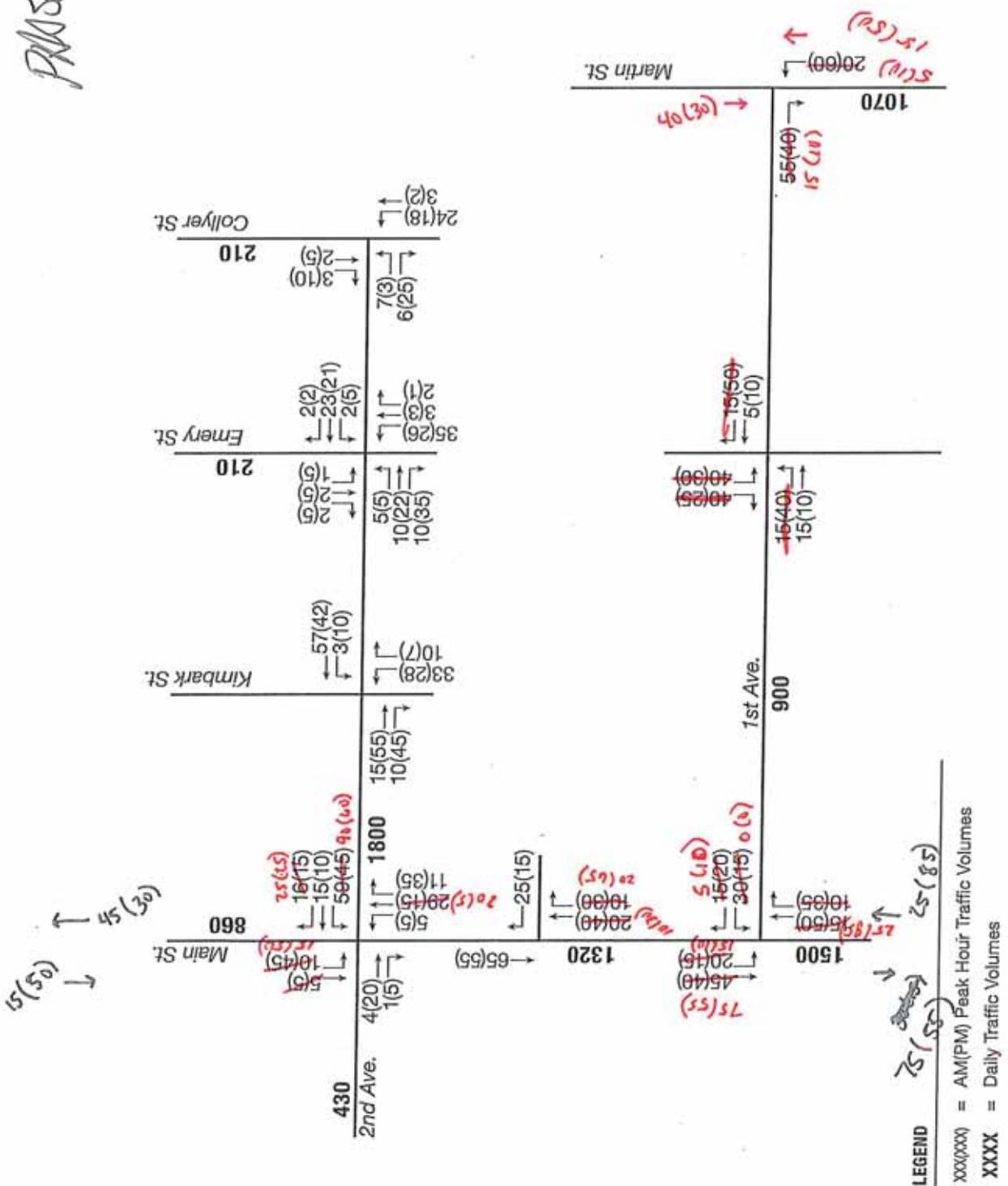
$5(5)$	$\sqcap$	$5(5)$	$\sqcap$
$5(5)$	$\sqcap$	$5(5)$	$\sqcap$
$135(10)$	$\sqcap$	$71\Gamma$	$\sqcap$
$5(5)$	$\sqcap$	$5(5)$	$\sqcap$
$5(5)$	$\sqcap$	$5(5)$	$\sqcap$
$5(5)$	$\sqcap$	$5(5)$	$\sqcap$
$160(550)$	$\sqcap$	$15(15)$	$\sqcap$

PHASE 1

PG 9

ACCOMPANIES 2018 w/out EMERY

- SHOWS ADJUSTMENTS TO REMOVE  
EMERY TRAFFIC FROM 150 MAIN



LEGEND  
XXXX = AM(PM) Peak Hour Traffic Volumes  
XXXX = Daily Traffic Volumes

Figure 5  
Short Range Future  
Site Generated Traffic Assignment

NORTH



FOOTHILLS ENGINEERING INC. 2018

P610

Muller Engineering Company, Inc.  
DESIGN NOTES AND COMPUTATIONS

BOSTON UPDATED

Subject: LONGMONT 2020 W/EMERY, NO BOSTON Sheet No. \_\_\_\_\_ Of \_\_\_\_\_

Prepared By: \_\_\_\_\_ Checked By: \_\_\_\_\_ Date: \_\_\_\_\_ Project No.: \_\_\_\_\_

$\Delta m(\text{pm})$		2017 VOLUMES PLUS Full 150 main traffic			
BOSTON		ASSUMED BOSTON CONNECT BIT MAIN: MARTIN			
20(90) $\rightarrow$ 165(350) $\rightarrow$ 30(55)		20(105) $\underline{\quad}$ 540(405) $\underline{\quad}$ 200(155)			
2nd		20(90) $\rightarrow$ 165(350) $\rightarrow$ 30(55)			
2nd		20(35) $\underline{\quad}$ 115(55) $\underline{\quad}$ 85(65)			
1st		20(140) $\rightarrow$ 140(295) $\rightarrow$ 20(100)			
1st		20(100) $\rightarrow$ 140(400) $\rightarrow$ 20(35) $\underline{\quad}$ 1040(945) $\rightarrow$ 25(110)			
BOSTON		20(60) $\rightarrow$ 50(130) $\rightarrow$ 10(20)			
BOSTON		10(50) $\underline{\quad}$ 10(10) $\underline{\quad}$ 20(20)			
BOSTON		71 $\Gamma$ 25(40) 30(20)			
ASSUMED VOLUMES TO/FROM EAST LEG DOWNGED W/ CONNECTION TO MARTIN					

## PAGE 2

P611

ACCOMPANIES 2020 W/EMERY, NO BOSTON

- SHOWS FULL DEVELOPMENT TRIP ASSIGNMENT

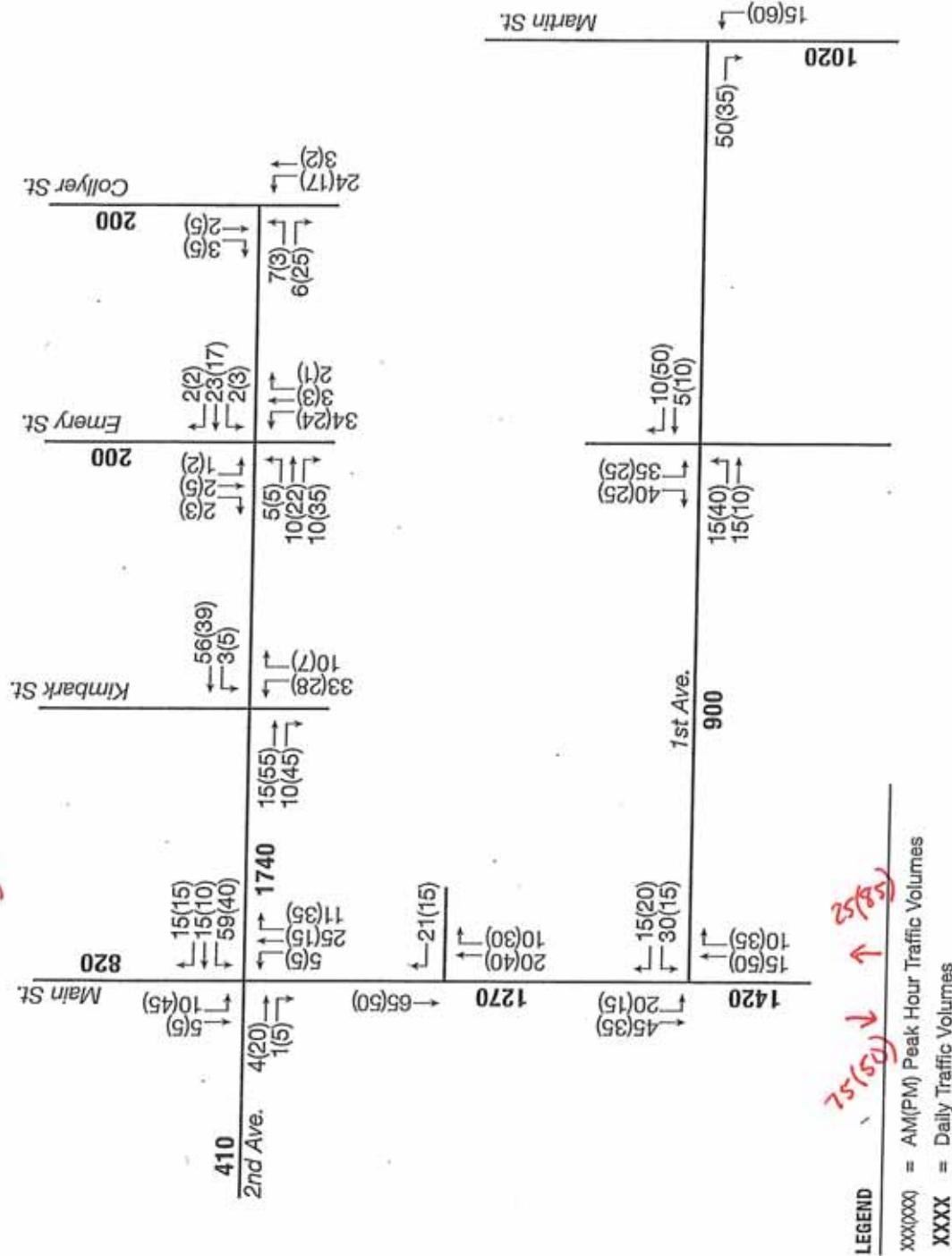


Figure 6  
Long Range Future  
Site Generated Traffic Assignment

NORTH



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P612

Muller Engineering Company, Inc.  
DESIGN NOTES AND COMPUTATIONS

BOSTON  
UPDATED

Subject: LONGMONT 2020 W/ BOSTON

Sheet No. \_\_\_\_\_ Of \_\_\_\_\_

Prepared By: \_\_\_\_\_

Checked By: \_\_\_\_\_

Date: \_\_\_\_\_

Project No.: \_\_\_\_\_

		2017 VOLUMES PLUS FULL ISO MAIN	
		ASSUMED BOSTON CONNECT BIT MAIN + MARCH	
3RD		L 65(105) - 430(325) F 200(155)	
	20(90) 1 L	71 L 95(130) - 45(100)	
	130(280) 1 L	45(100)	
	30(55) 1 L	55(100)	L 30(45) - 115(55) F 145(95)
2ND		71 L 45(110) - 55(105)	
	100(140) 1 L	100(100)	
	140(310) 1 L	140(60)	
	90(100) 1 L	90(60)	
1ST		L 15(20) - 55(35) F 80(35)	L 5(5) - 5(5) F 5(5)
	10(35) 1 L	10(20)	30(95) 1 L 71 L
	15(70) 1 L	15(20)	5(5) 1 L 5(5)
	10(20) 1 L	10(20)	20(35) 1 L 5(5)
BOSTON		L 10(50) - 285(265) F 20(20)	
TOWN	10(50) 1 L	10(10) 1 L	BOSTON CONNECTION ASSUMED TO HAVE 3,000 ADT W/ RR CROSSING
	20(10) 1 L	225(260) 1 L	
	20(10) 1 L	40(30) 1 L	
	20(10) 1 L	20(10) 1 L	
	20(10) 1 L	20(10) 1 L	
	20(10) 1 L	20(10) 1 L	

PULSE 2

PG 13

ACCOMPANIES 2020 W/OUT EMERY, W/BOSTON

- SHOW TRIP ASSIGNMENT W/OUT EMERY FOR  
FULL BUILD OUT

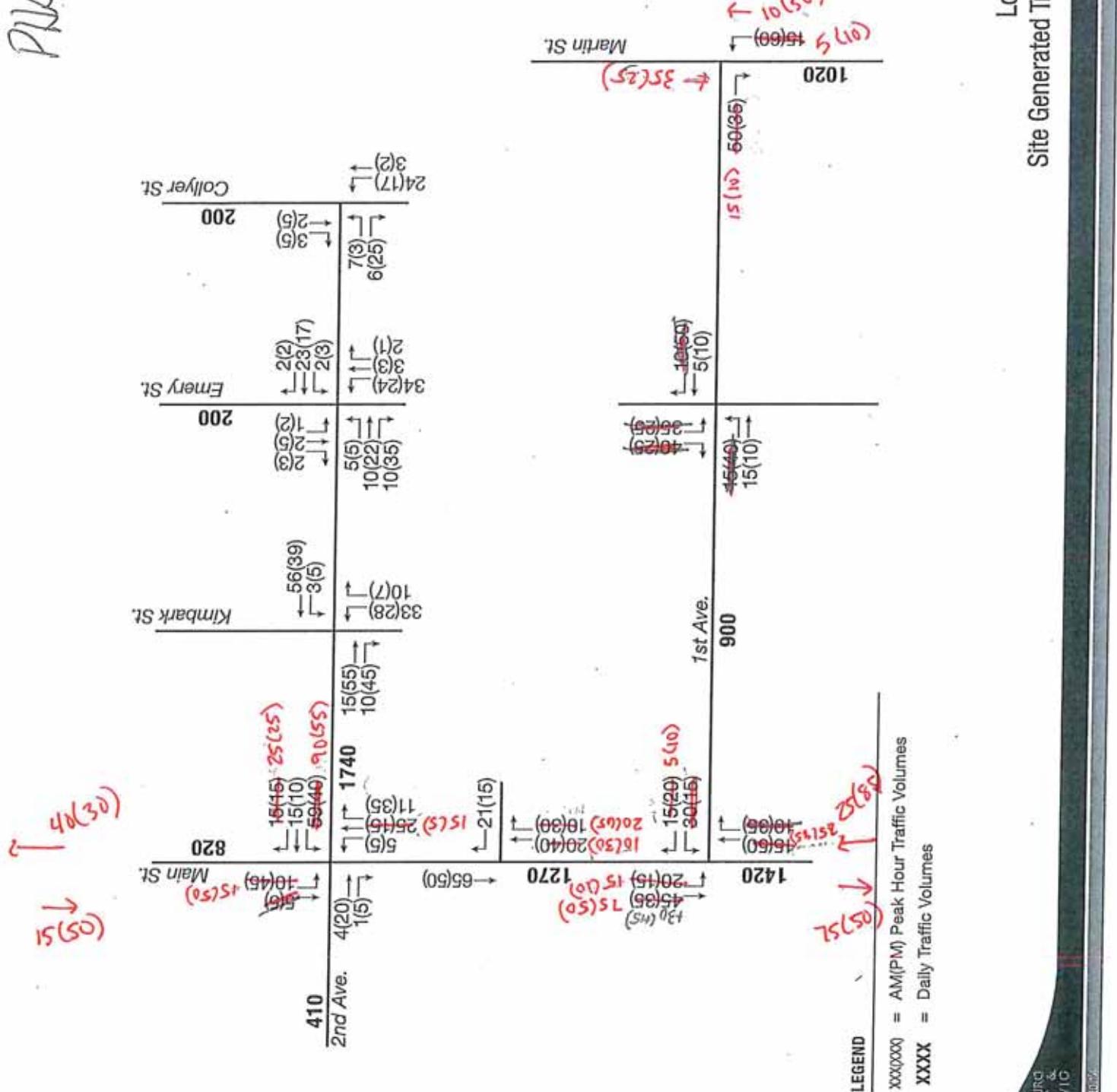


Figure 6  
Long Range Future  
Site Generated Traffic Assignment

NORTH

PG 14

Muller Engineering Company, Inc.  
DESIGN NOTES AND COMPUTATIONS

BOSTON  
UPDATED

Subject: 2040 W/EMERY NO BOSTON

Sheet No. \_\_\_\_\_ Of \_\_\_\_\_

Prepared By: \_\_\_\_\_ Checked By: \_\_\_\_\_ Date: \_\_\_\_\_ Project No.: \_\_\_\_\_

<u>MAIN (PM)</u>								
110 (55) 112 (55) J 1 L	L 70 (110) — 575 (430) F 210 (165)							
20 (45) 175 (375) 30 (60) J 1 L	715 55 510 (160) 55 (80)							
20 (70) 115 (100) 30 (75) J 1 L	L 25 (40) — 130 (60) F 95 (75)							
90 (100) 160 (335) 100 (115) J 1 L	715 50 (110) 50 (75)							
35 (30) 25 (25) 30 (10) J 1 L	L 25 (30) — 55 (35) F 145 (70)	75 (5) L	50 (5) L	L 5 (15) F 115 (75)	510 (5) F 145 (70)	510 (5) F 115 (75)	L 5 (5) F 115 (75)	L 5 (5) F 115 (75)
5 (15) 20 (95) 10 (20) J 1 L	715 50 (25) 50 (35)	20 (60) 50 (35)	715 50 (25)	30 (100) 55 (50)	715 50 (25)	715 50 (25)	715 50 (25)	715 50 (25)
15 (15) 10 (5) J 1 L	L 15 (55) — 15 (45) F 25 (25)							
10 (10) 15 (15) 25 (20) J 1 L	715 50 (25) 30 (145)	715 50 (25)						

PG 15

Muller Engineering Company, Inc.  
DESIGN NOTES AND COMPUTATIONS

BOSTON  
UPDATED

Subject: 2040 w/out Emery, w/BOSTON

Sheet No. \_\_\_\_\_ Of \_\_\_\_\_

Prepared By: \_\_\_\_\_ Checked By: \_\_\_\_\_ Date: \_\_\_\_\_ Project No.: \_\_\_\_\_

PM (PM)		TOD 2020 VOLUMES DEVELOPED GROWTH RATE TO 2040 FROM Longmont ROADWAY PLAN	
3RD		- APPLIED GROWTH TO 2020 VOLUMES	
20(95)      110(130) 140(215)      110(130) 30(60)      110(130) 70(55)      35(55) 100(100)      90(100) 140(350)      140(350) 100(415)      90(100) 10(35)      15(75) 15(75)      10(20) 10(20)      30(20) 30(10)      1370(225) 30(10)      30(20) 15(35)      15(35) 15(35)      100(1825) 15(35)      15(35) 15(15)      235(270) 45(35)      45(35)		3RD AVE: 0.3% / YR 2ND AVE: 0.6% / YR 1ST AVE: 0.2% / YR BOSTON: 2.6% / YR MAIN: 1.1% / YR	
2ND		MARTIN	
1st		30(100) 5(5) 20(35) 10(25) 71F 111 15(55) 295(310) 25(25) 35(25) 620(1240) 55(85)	
Boston		5(5) 5(5) 5(5) 110(570) 15(45)	

## Appendix B Synchro 9 LOS Output



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑	↑	↑	↑↑		↑	↑↑	
Traffic Volume (vph)	20	160	30	195	525	65	45	360	90	85	860	85
Future Volume (vph)	20	160	30	195	525	65	45	360	90	85	860	85
Satd. Flow (prot)	1770	3454	0	1770	3539	1583	1770	3433	0	1770	3493	0
Flt Permitted	0.437				0.462			0.214			0.446	
Satd. Flow (perm)	814	3454	0	861	3539	1583	399	3433	0	831	3493	0
Satd. Flow (RTOR)		20				68		39			13	
Lane Group Flow (vph)	22	207	0	212	571	71	49	489	0	92	1027	0
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4			8		8	2			6	
Total Split (s)	27.0	27.0		12.0	39.0	39.0	12.0	49.0		12.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9	5.9	4.0	5.2		4.0	5.2	
Act Effct Green (s)	11.6	11.6		25.5	23.6	23.6	62.5	55.9		64.2	56.7	
Actuated g/C Ratio	0.12	0.12		0.26	0.24	0.24	0.62	0.56		0.64	0.57	
v/c Ratio	0.24	0.50		0.73	0.69	0.17	0.14	0.25		0.15	0.52	
Control Delay	44.6	40.8		46.8	39.1	8.6	5.8	10.7		7.3	15.5	
Queue Delay	0.0	0.0		0.0	0.1	0.0	0.0	0.0		0.0	0.0	
Total Delay	44.6	40.8		46.8	39.2	8.6	5.8	10.7		7.3	15.5	
LOS	D	D		D	D	A	A	B		A	B	
Approach Delay		41.2			38.5			10.3			14.8	
Approach LOS		D			D			B			B	

#### Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 85 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 23.5

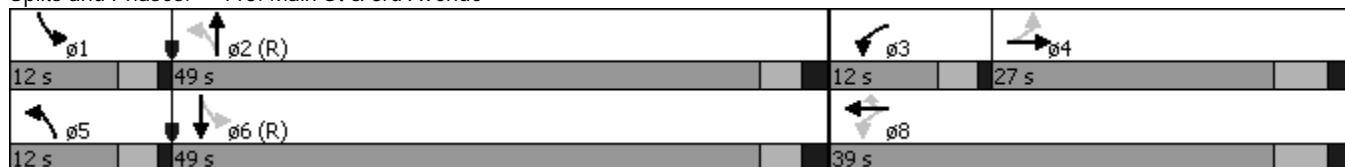
Intersection LOS: C

Intersection Capacity Utilization 66.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 113: Main St & 3rd Avenue



Lanes, Volumes, Timings  
114: Main St & 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	130	85	25	95	5	35	555	30	15	865	55
Future Volume (vph)	80	130	85	25	95	5	35	555	30	15	865	55
Satd. Flow (prot)	1770	1863	1583	1770	1850	0	1770	3539	1583	1770	3507	0
Flt Permitted	0.665			0.545			0.272			0.424		
Satd. Flow (perm)	1239	1863	1583	1015	1850	0	507	3539	1583	790	3507	0
Satd. Flow (RTOR)				92		2				33		18
Lane Group Flow (vph)	87	141	92	27	108	0	38	603	33	16	1000	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			2	6	
Total Split (s)	20.0	20.0	20.0	20.0	20.0		80.0	80.0	80.0	80.0	80.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9	5.9	5.9	5.9	
Act Effct Green (s)	12.3	12.3	12.3	12.3	12.3		76.6	76.6	76.6	76.6	76.6	
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12		0.77	0.77	0.77	0.77	0.77	
v/c Ratio	0.57	0.62	0.34	0.22	0.47		0.10	0.22	0.03	0.03	0.37	
Control Delay	56.0	53.3	11.8	42.7	46.5		4.1	3.7	1.2	4.5	4.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	56.0	53.3	11.8	42.7	46.5		4.1	3.7	1.2	4.5	4.4	
LOS	E	D	B	D	D		A	A	A	A	A	
Approach Delay		42.1			45.7				3.6		4.4	
Approach LOS		D			D			A			A	

#### Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 45 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 12.4

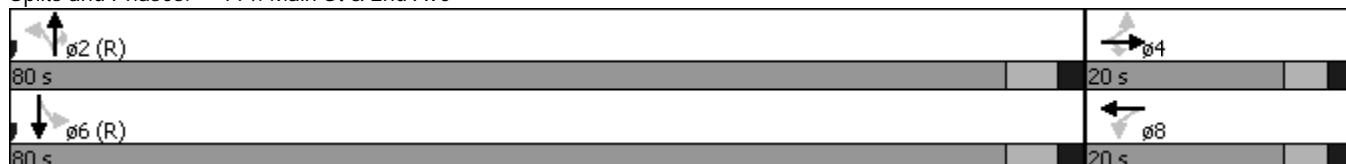
Intersection LOS: B

Intersection Capacity Utilization 53.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 114: Main St & 2nd Ave





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↓↓		
Traffic Volume (vph)	5	20	10	105	55	10	10	480	30	10	965	25
Future Volume (vph)	5	20	10	105	55	10	10	480	30	10	965	25
Satd. Flow (prot)	1593	1593	0	1593	1638	0	1593	3185	1425	0	3169	0
Flt Permitted	0.833			0.455			0.214				0.949	
Satd. Flow (perm)	1397	1593	0	763	1638	0	359	3185	1425	0	3011	0
Satd. Flow (RTOR)			11			8			72			4
Lane Group Flow (vph)	5	33	0	114	71	0	11	522	33	0	1087	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases			4		3	8		5	2			6
Permitted Phases		4				8			2		2	6
Total Split (s)	15.0	15.0		10.0	25.0		10.0	75.0	75.0	65.0	65.0	
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9			5.9
Act Effct Green (s)	7.1	7.1		15.0	13.4		77.0	75.1	75.1			73.1
Actuated g/C Ratio	0.07	0.07		0.15	0.13		0.77	0.75	0.75			0.73
v/c Ratio	0.05	0.27		0.67	0.31		0.03	0.22	0.03			0.49
Control Delay	43.2	37.8		56.4	36.1		4.1	4.6	0.2			7.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0			0.0
Total Delay	43.2	37.8		56.4	36.1		4.1	4.6	0.2			7.2
LOS	D	D		E	D		A	A	A			A
Approach Delay		38.5			48.6			4.3				7.2
Approach LOS		D			D			A				A

#### Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 68 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.0

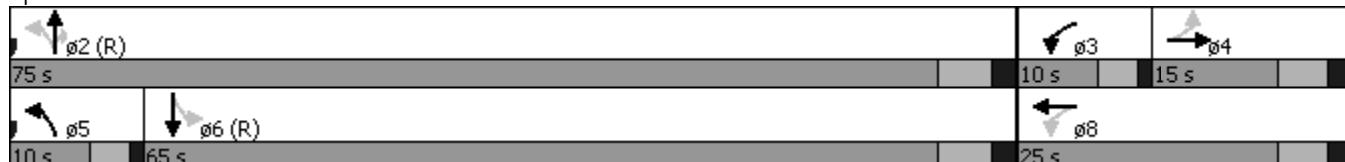
Intersection LOS: B

Intersection Capacity Utilization 61.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 115: Main St & 1st Ave



Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	30	5	5	5	5	5	10	140	5	5	450	130
Future Vol, veh/h	30	5	5	5	5	5	10	140	5	5	450	130
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	200	-	-	-	-	600
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	5	5	5	5	5	11	152	5	5	489	141

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	682	679	489	682	677	155	489	0	0	158	0	0
Stage 1	500	500	-	177	177	-	-	-	-	-	-	-
Stage 2	182	179	-	505	500	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	364	374	579	364	375	891	1074	-	-	1422	-	-
Stage 1	553	543	-	825	753	-	-	-	-	-	-	-
Stage 2	820	751	-	549	543	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	353	368	579	352	369	891	1074	-	-	1422	-	-
Mov Cap-2 Maneuver	353	368	-	352	369	-	-	-	-	-	-	-
Stage 1	547	540	-	817	745	-	-	-	-	-	-	-
Stage 2	801	743	-	535	540	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.9	13.3	0.5	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1074	-	-	373	450	1422	-	-
HCM Lane V/C Ratio	0.01	-	-	0.117	0.036	0.004	-	-
HCM Control Delay (s)	8.4	-	-	15.9	13.3	7.5	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0	-	-

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	5	15	20	560	960	10
Future Vol, veh/h	5	15	20	560	960	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	16	22	609	1043	11

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1397	527	1054
Stage 1	1049	-	-
Stage 2	348	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	132	496	656
Stage 1	298	-	-
Stage 2	686	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	128	496	656
Mov Cap-2 Maneuver	128	-	-
Stage 1	298	-	-
Stage 2	663	-	-

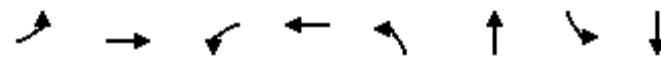
Approach	EB	NB	SB
HCM Control Delay, s	18.5	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	656	-	289	-	-
HCM Lane V/C Ratio	0.033	-	0.075	-	-
HCM Control Delay (s)	10.7	-	18.5	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

## Timings

113: Main St &amp; 3rd Ave

7/26/2016



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↑ ↘	↑ ↗ (R)						
Traffic Volume (vph)	85	340	150	395	65	950	100	675
Future Volume (vph)	85	340	150	395	65	950	100	675
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases				4	3	8	5	2
Permitted Phases						2		6
Detector Phase				4	4	3	8	5
Switch Phase							2	1
Minimum Initial (s)	5.0	5.0	4.0	5.0	4.0	6.0	4.0	6.0
Minimum Split (s)	22.5	22.5	8.0	24.5	8.0	25.5	8.0	25.5
Total Split (s)	27.0	27.0	14.0	41.0	10.0	49.0	10.0	49.0
Total Split (%)	27.0%	27.0%	14.0%	41.0%	10.0%	49.0%	10.0%	49.0%
Yellow Time (s)	3.9	3.9	3.0	3.9	3.0	3.2	3.0	3.2
All-Red Time (s)	2.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	4.0	5.9	4.0	5.2	4.0	5.2
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effect Green (s)	17.6	17.6	33.2	31.3	54.4	46.9	56.0	49.3
Actuated g/C Ratio	0.18	0.18	0.33	0.31	0.54	0.47	0.56	0.49
v/c Ratio	0.62	0.69	0.56	0.49	0.20	0.71	0.47	0.47
Control Delay	56.1	42.8	31.6	27.1	18.0	34.7	17.2	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.1	42.8	31.6	27.1	18.0	34.7	17.2	18.8
LOS	E	D	C	C	B	C	B	B
Approach Delay		45.2		28.1		33.8		18.6
Approach LOS		D		C		C		B

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 21 (21%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 30.2

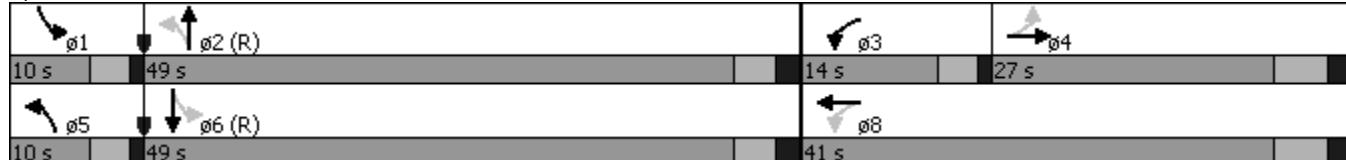
Intersection LOS: C

Intersection Capacity Utilization 72.1%

ICU Level of Service C

Analysis Period (min) 15

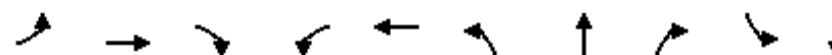
Splits and Phases: 113: Main St &amp; 3rd Ave



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↑ ↗	↑ ↗	↗ ↘	↗ ↘	↗ ↘	↗ ↘	↑ ↗	↗ ↘	↗ ↘	↑ ↗
Traffic Volume (vph)	135	280	90	25	45	55	980	55	10	780
Future Volume (vph)	135	280	90	25	45	55	980	55	10	780
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases					4		8		2	6
Permitted Phases	4			4	8		2		2	6
Detector Phase	4	4	4	8	8	2	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	8.0	8.0	8.0	6.0	6.0
Minimum Split (s)	26.5	26.5	26.5	26.5	26.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.9	5.9	5.9	5.9	5.9
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	21.0	21.0	21.0	21.0	21.0	67.9	67.9	67.9	67.9	67.9
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.68	0.68	0.68	0.68	0.68
v/c Ratio	0.53	0.78	0.24	0.25	0.18	0.16	0.44	0.06	0.04	0.38
Control Delay	41.6	51.1	8.8	37.4	23.8	3.8	3.3	0.5	2.7	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	51.1	8.8	37.4	23.8	3.8	3.3	0.5	2.7	5.4
LOS	D	D	A	D	C	A	A	A	A	A
Approach Delay		41.0				27.5		3.2		5.4
Approach LOS		D				C		A		A

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 47 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 12.4

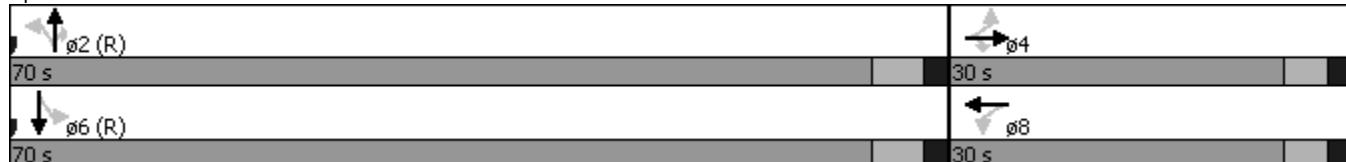
Intersection LOS: B

Intersection Capacity Utilization 67.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↑ ↗	↗ ↘	↖ ↗	↖ ↙	↖ ↗	↑ ↗ ↘	↖ ↗	↙ ↗	↖ ↗ ↘
Traffic Volume (vph)	15	85	50	35	20	1035	100	10	920
Future Volume (vph)	15	85	50	35	20	1035	100	10	920
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA
Protected Phases				4	3	8	5	2	6
Permitted Phases				4		8		2	6
Detector Phase				4	4	3	8	5	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	4.0	5.0	4.0	8.0	8.0	8.0	8.0
Minimum Split (s)	25.5	25.5	8.0	25.5	8.0	20.5	20.5	20.5	20.5
Total Split (s)	21.0	21.0	9.0	30.0	9.0	70.0	70.0	61.0	61.0
Total Split (%)	21.0%	21.0%	9.0%	30.0%	9.0%	70.0%	70.0%	61.0%	61.0%
Yellow Time (s)	3.6	3.6	3.0	3.6	3.0	3.9	3.9	3.9	3.9
All-Red Time (s)	2.0	2.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	4.0	5.6	4.0	5.9	5.9	5.9	5.9
Lead/Lag	Lag	Lag	Lead		Lag			Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes			Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	11.5	11.5	20.3	18.7	71.7	69.8	69.8		66.2
Actuated g/C Ratio	0.12	0.12	0.20	0.19	0.72	0.70	0.70		0.66
v/c Ratio	0.12	0.58	0.26	0.16	0.06	0.51	0.11		0.52
Control Delay	39.7	49.8	33.4	26.7	6.3	8.9	1.6		7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	39.7	49.8	33.4	26.7	6.3	8.9	1.6		7.4
LOS	D	D	C	C	A	A	A		A
Approach Delay			48.5		30.2		8.2		7.4
Approach LOS			D		C		A		A

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 39 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 10.9

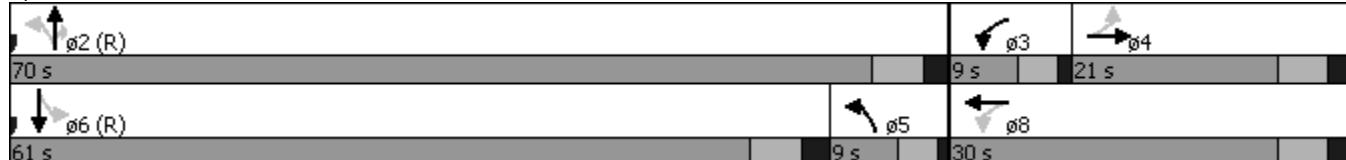
Intersection LOS: B

Intersection Capacity Utilization 56.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	90	5	40	5	5	5	35	455	5	5	355	70
Future Vol, veh/h	90	5	40	5	5	5	35	455	5	5	355	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	200	-	-	-	-	600
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	-	0
Grade, %	-	0	-	-	0	-	-	0	-	-	-	0
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	98	5	43	5	5	5	38	495	5	5	386	76

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	976	973	386	994	970	497	386	0	0	500	0	0
Stage 1	397	397	-	573	573	-	-	-	-	-	-	-
Stage 2	579	576	-	421	397	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	230	252	662	224	253	573	1172	-	-	1064	-	-
Stage 1	629	603	-	505	504	-	-	-	-	-	-	-
Stage 2	501	502	-	610	603	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	217	242	662	200	243	573	1172	-	-	1064	-	-
Mov Cap-2 Maneuver	217	242	-	200	243	-	-	-	-	-	-	-
Stage 1	609	599	-	489	488	-	-	-	-	-	-	-
Stage 2	475	486	-	561	599	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.7	18.9	0.6	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1172	-	-	272	276	1064	-	-
HCM Lane V/C Ratio	0.032	-	-	0.539	0.059	0.005	-	-
HCM Control Delay (s)	8.2	-	-	32.7	18.9	8.4	0	-
HCM Lane LOS	A	-	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	3	0.2	0	-	-

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	10	15	40	1085	910	5
Future Vol, veh/h	10	15	40	1085	910	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	16	43	1179	989	5

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1669	497	995
Stage 1	992	-	-
Stage 2	677	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	87	519	691
Stage 1	320	-	-
Stage 2	466	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	82	519	691
Mov Cap-2 Maneuver	82	-	-
Stage 1	320	-	-
Stage 2	437	-	-

Approach	EB	NB	SB
HCM Control Delay, s	30.9	0.4	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	691	-	166	-	-
HCM Lane V/C Ratio	0.063	-	0.164	-	-
HCM Control Delay (s)	10.6	-	30.9	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

## Timings

113: Main St &amp; 3rd Avenue

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑	↑	↑	↑↑		↑	↑↑	
Traffic Volume (vph)	20	165	30	200	540	65	45	370	95	90	885	90
Future Volume (vph)	20	165	30	200	540	65	45	370	95	90	885	90
Satd. Flow (prot)	1770	3458	0	1770	3539	1583	1770	3429	0	1770	3490	0
Flt Permitted	0.431			0.462			0.202			0.436		
Satd. Flow (perm)	803	3458	0	861	3539	1583	376	3429	0	812	3490	0
Satd. Flow (RTOR)		19				68		40			14	
Lane Group Flow (vph)	22	212	0	217	587	71	49	505	0	98	1060	0
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4				8		8	2			6
Total Split (s)	27.0	27.0		12.0	39.0	39.0	12.0	49.0		12.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9	5.9	4.0	5.2		4.0	5.2	
Act Effct Green (s)	11.8	11.8		25.7	23.8	23.8	62.1	55.5		64.0	56.4	
Actuated g/C Ratio	0.12	0.12		0.26	0.24	0.24	0.62	0.56		0.64	0.56	
v/c Ratio	0.23	0.50		0.74	0.70	0.17	0.15	0.26		0.17	0.54	
Control Delay	44.1	40.8		47.2	39.2	8.5	5.8	11.0		7.5	16.0	
Queue Delay	0.0	0.0		0.0	0.1	0.0	0.0	0.0		0.0	0.0	
Total Delay	44.1	40.8		47.2	39.3	8.5	5.8	11.0		7.5	16.0	
LOS	D	D		D	D	A	A	B		A	B	
Approach Delay		41.1			38.7			10.5			15.3	
Approach LOS		D			D			B			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 25 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 23.8

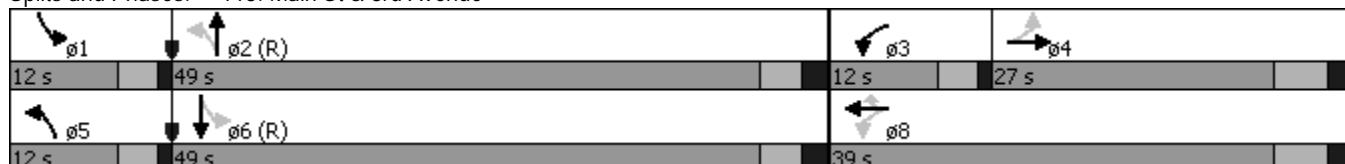
Intersection LOS: C

Intersection Capacity Utilization 67.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Avenue



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	135	90	25	100	5	35	570	30	15	890	55
Future Volume (vph)	80	135	90	25	100	5	35	570	30	15	890	55
Satd. Flow (prot)	1770	1863	1583	1770	1850	0	1770	3511	0	1770	3507	0
Flt Permitted	0.644			0.525			0.264			0.404		
Satd. Flow (perm)	1200	1863	1583	978	1850	0	492	3511	0	753	3507	0
Satd. Flow (RTOR)				98		2			15			17
Lane Group Flow (vph)	87	147	98	27	114	0	38	653	0	16	1027	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	20.0	20.0	20.0	20.0	20.0		80.0	80.0		80.0	80.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	12.4	12.4	12.4	12.4	12.4		76.5	76.5		76.5	76.5	
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12		0.76	0.76		0.76	0.76	
v/c Ratio	0.58	0.64	0.35	0.22	0.49		0.10	0.24		0.03	0.38	
Control Delay	56.9	54.0	11.6	42.9	47.0		4.2	3.7		1.1	4.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	56.9	54.0	11.6	42.9	47.0		4.2	3.7		1.1	4.0	
LOS	E	D	B	D	D		A	A		A	A	
Approach Delay		42.3			46.2			3.7			4.0	
Approach LOS		D			D			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 45 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 12.4

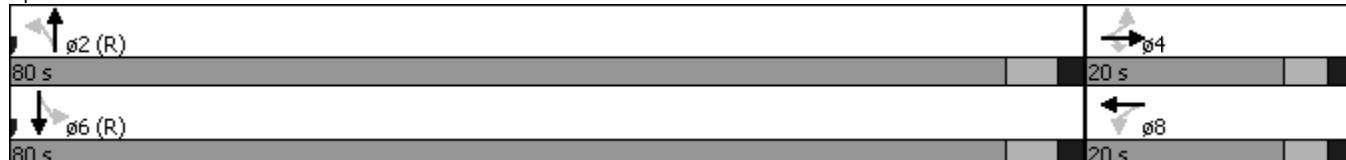
Intersection LOS: B

Intersection Capacity Utilization 53.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↓↓		
Traffic Volume (vph)	5	20	10	110	55	10	10	495	30	10	995	25
Future Volume (vph)	5	20	10	110	55	10	10	495	30	10	995	25
Satd. Flow (prot)	1593	1593	0	1593	1638	0	1593	3185	1425	0	3173	0
Flt Permitted	0.833			0.455			0.205				0.949	
Satd. Flow (perm)	1397	1593	0	763	1638	0	344	3185	1425	0	3011	0
Satd. Flow (RTOR)			11			8			72			4
Lane Group Flow (vph)	5	33	0	120	71	0	11	538	33	0	1120	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases			4		3	8		5	2			6
Permitted Phases		4			8			2		2	6	
Total Split (s)	15.0	15.0		10.0	25.0		11.0	75.0	75.0	64.0	64.0	
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9		5.9	
Act Effct Green (s)	7.1	7.1		15.0	13.4		77.0	75.1	75.1		73.0	
Actuated g/C Ratio	0.07	0.07		0.15	0.13		0.77	0.75	0.75		0.73	
v/c Ratio	0.05	0.27		0.70	0.31		0.03	0.23	0.03		0.51	
Control Delay	43.2	37.8		59.3	36.1		4.2	4.6	0.2		11.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	43.2	37.8		59.3	36.1		4.2	4.6	0.2		11.0	
LOS	D	D		E	D		A	A	A		B	
Approach Delay		38.5			50.7			4.4			11.0	
Approach LOS		D			D			A			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 68 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 13.5

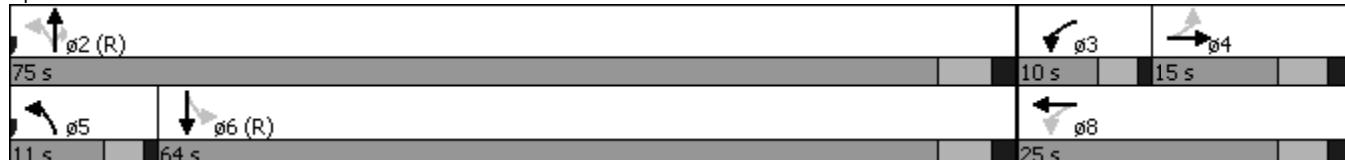
Intersection LOS: B

Intersection Capacity Utilization 62.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	30	5	5	5	5	5	10	145	5	5	465	135
Future Vol, veh/h	30	5	5	5	5	5	10	145	5	5	465	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	650
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	5	5	5	5	5	11	158	5	5	505	147

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	704	701	505	704	698	160	505	0	0	163	0	0
Stage 1	516	516	-	182	182	-	-	-	-	-	-	-
Stage 2	188	185	-	522	516	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	352	363	567	352	364	885	1060	-	-	1416	-	-
Stage 1	542	534	-	820	749	-	-	-	-	-	-	-
Stage 2	814	747	-	538	534	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	341	357	567	340	358	885	1060	-	-	1416	-	-
Mov Cap-2 Maneuver	341	357	-	340	358	-	-	-	-	-	-	-
Stage 1	536	531	-	811	741	-	-	-	-	-	-	-
Stage 2	795	739	-	524	531	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.3	13.6	0.5	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1060	-	-	361	437	1416	-	-
HCM Lane V/C Ratio	0.01	-	-	0.12	0.037	0.004	-	-
HCM Control Delay (s)	8.4	-	-	16.3	13.6	7.6	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0	-	-

## Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	5	20	10	5	5	25	570	15	20	980	10
Future Vol, veh/h	5	5	20	10	5	5	25	570	15	20	980	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	22	11	5	5	27	620	16	22	1065	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1481	1804	538	1261	1802	318	1076	0	0	636	0	0
Stage 1	1114	1114	-	682	682	-	-	-	-	-	-	-
Stage 2	367	690	-	579	1120	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	87	79	488	127	79	678	644	-	-	943	-	-
Stage 1	222	282	-	406	448	-	-	-	-	-	-	-
Stage 2	625	444	-	468	280	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	78	74	488	109	74	678	644	-	-	943	-	-
Mov Cap-2 Maneuver	78	74	-	109	74	-	-	-	-	-	-	-
Stage 1	213	275	-	389	429	-	-	-	-	-	-	-
Stage 2	586	425	-	428	273	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.4	41.5	0.4	0.2
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	644	-	-	174	120	943	-	-
HCM Lane V/C Ratio	0.042	-	-	0.187	0.181	0.023	-	-
HCM Control Delay (s)	10.8	-	-	30.4	41.5	8.9	-	-
HCM Lane LOS	B	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.6	0.1	-	-

## Timings

113: Main St &amp; 3rd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	90	350	55	155	405	105	65	980	130	105	695	70
Future Volume (vph)	90	350	55	155	405	105	65	980	130	105	695	70
Satd. Flow (prot)	1770	3468	0	1770	3429	0	1770	3476	0	1770	3490	0
Flt Permitted	0.445			0.266			0.268			0.109		
Satd. Flow (perm)	829	3468	0	495	3429	0	499	3476	0	203	3490	0
Satd. Flow (RTOR)		16			36			18			13	
Lane Group Flow (vph)	98	440	0	168	554	0	71	1206	0	114	831	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4			8			2			6	
Total Split (s)	27.0	27.0		14.0	41.0		10.0	49.0		10.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9		4.0	5.2		4.0	5.2	
Act Effct Green (s)	18.0	18.0		33.6	31.7		53.9	46.4		55.7	48.9	
Actuated g/C Ratio	0.18	0.18		0.34	0.32		0.54	0.46		0.56	0.49	
v/c Ratio	0.66	0.69		0.58	0.50		0.20	0.74		0.52	0.49	
Control Delay	59.0	42.7		32.2	27.0		18.0	36.2		19.8	19.3	
Queue Delay	0.0	0.0		0.0	0.4		0.0	0.0		0.0	0.0	
Total Delay	59.0	42.7		32.2	27.5		18.0	36.2		19.8	19.3	
LOS	E	D		C	C		B	D		B	B	
Approach Delay		45.6			28.6			35.2			19.3	
Approach LOS		D			C			D			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 21 (21%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 31.1

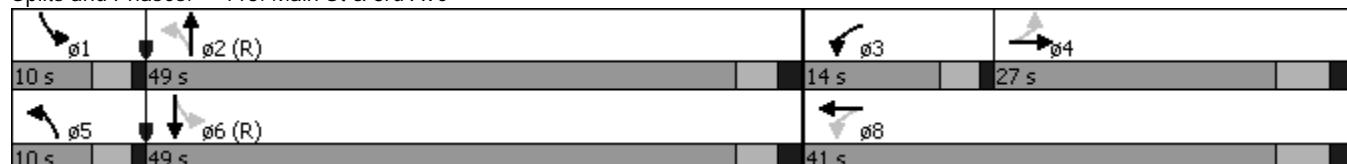
Intersection LOS: C

Intersection Capacity Utilization 74.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Ave



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	290	95	25	45	20	55	1010	55	10	805	45
Future Volume (vph)	140	290	95	25	45	20	55	1010	55	10	805	45
Satd. Flow (prot)	1770	1863	1583	1770	1777	0	1770	3511	0	1770	3511	0
Flt Permitted	0.711			0.264			0.281			0.206		
Satd. Flow (perm)	1324	1863	1583	492	1777	0	523	3511	0	384	3511	0
Satd. Flow (RTOR)			94		21			11			11	
Lane Group Flow (vph)	152	315	103	27	71	0	60	1158	0	11	924	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	30.0	30.0	30.0	30.0	30.0		70.0	70.0		70.0	70.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	21.4	21.4	21.4	21.4	21.4		67.5	67.5		67.5	67.5	
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.68	0.68		0.68	0.68	
v/c Ratio	0.54	0.79	0.25	0.26	0.18		0.17	0.49		0.04	0.39	
Control Delay	41.5	51.6	9.3	37.8	23.6		3.9	3.5		2.8	5.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.5	51.6	9.3	37.8	23.6		3.9	3.5		2.8	5.6	
LOS	D	D	A	D	C		A	A		A	A	
Approach Delay		41.3			27.5			3.5			5.5	
Approach LOS		D			C			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 47 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 12.6

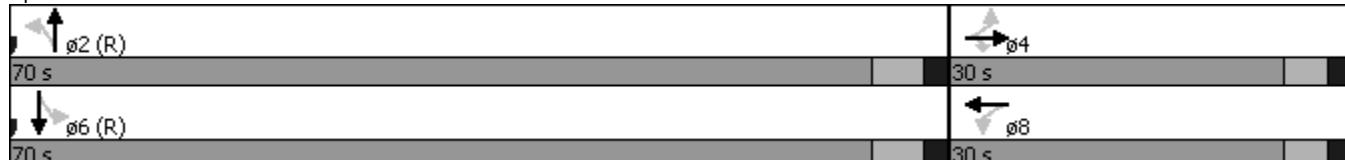
Intersection LOS: B

Intersection Capacity Utilization 69.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↗ ↘		↑ ↗	↗ ↘		↑ ↗	↑ ↘	↑ ↗	↗ ↘	↗ ↘	
Traffic Volume (vph)	15	90	20	50	35	10	20	1065	105	10	950	10
Future Volume (vph)	15	90	20	50	35	10	20	1065	105	10	950	10
Satd. Flow (prot)	1593	1630	0	1593	1619	0	1593	3185	1425	0	3176	0
Flt Permitted	0.725			0.476			0.229				0.939	
Satd. Flow (perm)	1215	1630	0	798	1619	0	384	3185	1425	0	2985	0
Satd. Flow (RTOR)		10				11				114		2
Lane Group Flow (vph)	16	120	0	54	49	0	22	1158	114	0	1055	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			3	8		5	2		6	
Permitted Phases	4				8			2		2	6	
Total Split (s)	21.0	21.0			9.0	30.0		9.0	70.0	70.0	61.0	61.0
Total Lost Time (s)	5.6	5.6			4.0	5.6		4.0	5.9	5.9		5.9
Act Effct Green (s)	11.7	11.7			20.5	18.9		71.5	69.6	69.6		66.0
Actuated g/C Ratio	0.12	0.12			0.20	0.19		0.72	0.70	0.70		0.66
v/c Ratio	0.11	0.60			0.27	0.16		0.07	0.52	0.11		0.54
Control Delay	39.4	50.3			33.3	26.5		6.5	9.2	1.6		7.6
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	39.4	50.3			33.3	26.5		6.5	9.2	1.6		7.6
LOS	D	D		C	C		A	A	A		A	
Approach Delay		49.0				30.1			8.5			7.6
Approach LOS		D			C			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 39 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 11.1

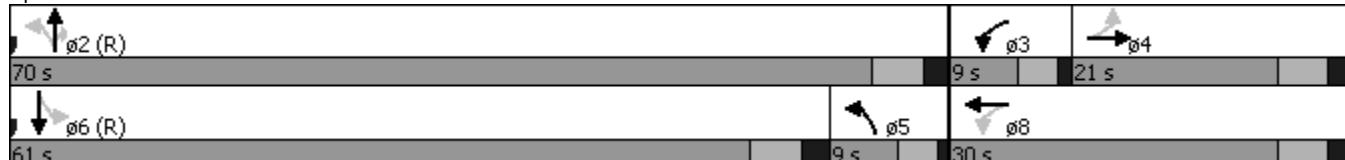
Intersection LOS: B

Intersection Capacity Utilization 58.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	95	5	40	5	5	5	35	470	5	5	365	70
Future Vol, veh/h	95	5	40	5	5	5	35	470	5	5	365	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	620
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	103	5	43	5	5	5	38	511	5	5	397	76

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1003	1000	397	1022	998	514	397	0	0	516	0	0
Stage 1	408	408	-	590	590	-	-	-	-	-	-	-
Stage 2	595	592	-	432	408	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	221	243	652	214	244	560	1162	-	-	1050	-	-
Stage 1	620	597	-	494	495	-	-	-	-	-	-	-
Stage 2	491	494	-	602	597	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	209	233	652	190	234	560	1162	-	-	1050	-	-
Mov Cap-2 Maneuver	209	233	-	190	234	-	-	-	-	-	-	-
Stage 1	600	593	-	478	479	-	-	-	-	-	-	-
Stage 2	465	478	-	553	593	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	36.4	19.5	0.6	0.1
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1162	-	-	261	265	1050	-	-
HCM Lane V/C Ratio	0.033	-	-	0.583	0.062	0.005	-	-
HCM Control Delay (s)	8.2	-	-	36.4	19.5	8.4	0	-
HCM Lane LOS	A	-	-	E	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	3.4	0.2	0	-	-

## Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	5	15	10	5	25	40	1105	10	15	930	10
Future Vol, veh/h	5	5	15	10	5	25	40	1105	10	15	930	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	16	11	5	27	43	1201	11	16	1011	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1739	2348	511	1834	2347	606	1022	0	0	1212	0	0
Stage 1	1049	1049	-	1293	1293	-	-	-	-	-	-	-
Stage 2	690	1299	-	541	1054	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	56	36	508	47	36	440	675	-	-	571	-	-
Stage 1	243	303	-	172	231	-	-	-	-	-	-	-
Stage 2	401	230	-	493	301	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	43	33	508	37	33	440	675	-	-	571	-	-
Mov Cap-2 Maneuver	43	33	-	37	33	-	-	-	-	-	-	-
Stage 1	228	295	-	161	216	-	-	-	-	-	-	-
Stage 2	343	215	-	455	293	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	67.1			86.8			0.4			0.2		
HCM LOS	F			F								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	675	-	-	84	84	571	-	-				
HCM Lane V/C Ratio	0.064	-	-	0.323	0.518	0.029	-	-				
HCM Control Delay (s)	10.7	-	-	67.1	86.8	11.5	-	-				
HCM Lane LOS	B	-	-	F	F	B	-	-				
HCM 95th %tile Q(veh)	0.2	-	-	1.2	2.2	0.1	-	-				

## Timings

113: Main St &amp; 3rd Avenue

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑	↑	↑	↑↑		↑	↑↑	
Traffic Volume (vph)	20	165	30	200	540	65	45	370	95	90	885	90
Future Volume (vph)	20	165	30	200	540	65	45	370	95	90	885	90
Satd. Flow (prot)	1770	3458	0	1770	3539	1583	1770	3429	0	1770	3490	0
Flt Permitted	0.431			0.462			0.202			0.436		
Satd. Flow (perm)	803	3458	0	861	3539	1583	376	3429	0	812	3490	0
Satd. Flow (RTOR)		19				68		40			14	
Lane Group Flow (vph)	22	212	0	217	587	71	49	505	0	98	1060	0
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4			8		8	2			6	
Total Split (s)	27.0	27.0		12.0	39.0	39.0	12.0	49.0		12.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9	5.9	4.0	5.2		4.0	5.2	
Act Effct Green (s)	11.8	11.8		25.7	23.8	23.8	62.1	55.5		64.0	56.4	
Actuated g/C Ratio	0.12	0.12		0.26	0.24	0.24	0.62	0.56		0.64	0.56	
v/c Ratio	0.23	0.50		0.74	0.70	0.17	0.15	0.26		0.17	0.54	
Control Delay	44.1	40.8		47.2	39.2	8.5	5.9	11.2		7.5	16.0	
Queue Delay	0.0	0.0		0.0	0.1	0.0	0.0	0.0		0.0	0.0	
Total Delay	44.1	40.8		47.2	39.3	8.5	5.9	11.2		7.5	16.0	
LOS	D	D		D	D	A	A	B		A	B	
Approach Delay		41.1			38.7			10.7			15.3	
Approach LOS		D			D			B			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 25 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 23.8

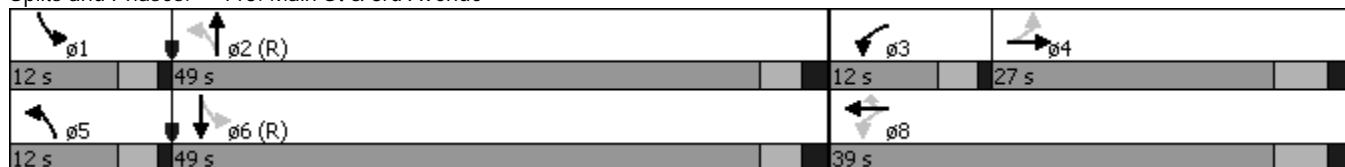
Intersection LOS: C

Intersection Capacity Utilization 67.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Avenue



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBC	WBL	WBT	WBC	NBL	NBT	NBC	SBL	SBT	SBC
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	80	135	90	55	100	5	35	570	35	15	890	55
Future Volume (vph)	80	135	90	55	100	5	35	570	35	15	890	55
Satd. Flow (prot)	1770	1863	1583	1770	1850	0	1770	3507	0	1770	3507	0
Flt Permitted	0.644			0.525			0.264			0.402		
Satd. Flow (perm)	1200	1863	1583	978	1850	0	492	3507	0	749	3507	0
Satd. Flow (RTOR)				98		2			17			17
Lane Group Flow (vph)	87	147	98	60	114	0	38	658	0	16	1027	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	20.0	20.0	20.0	20.0	20.0		80.0	80.0		80.0	80.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	12.4	12.4	12.4	12.4	12.4		76.5	76.5		76.5	76.5	
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12		0.76	0.76		0.76	0.76	
v/c Ratio	0.58	0.64	0.35	0.50	0.49		0.10	0.24		0.03	0.38	
Control Delay	56.9	54.0	11.6	54.4	47.0		4.2	3.7		1.1	4.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	56.9	54.0	11.6	54.4	47.0		4.2	3.7		1.1	4.0	
LOS	E	D	B	D	D		A	A		A	A	
Approach Delay		42.3			49.6			3.7			4.0	
Approach LOS		D			D			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 45 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 13.1

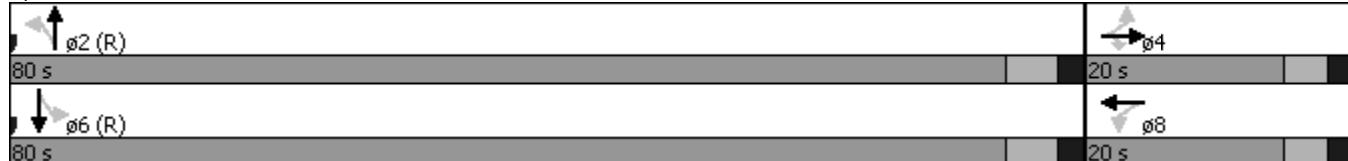
Intersection LOS: B

Intersection Capacity Utilization 53.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↔↔		
Traffic Volume (vph)	5	15	10	80	55	10	10	495	30	10	1025	25
Future Volume (vph)	5	15	10	80	55	10	10	495	30	10	1025	25
Satd. Flow (prot)	1593	1574	0	1593	1638	0	1593	3185	1425	0	3173	0
Flt Permitted	0.889			0.471			0.200				0.949	
Satd. Flow (perm)	1490	1574	0	790	1638	0	335	3185	1425	0	3011	0
Satd. Flow (RTOR)		11			8			72			4	
Lane Group Flow (vph)	5	27	0	87	71	0	11	538	33	0	1152	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2		2		6	
Total Split (s)	15.0	15.0		10.0	25.0		10.0	75.0	75.0	65.0	65.0	
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9		5.9	
Act Effct Green (s)	6.7	6.7		14.5	13.2		79.5	78.7	78.7		76.7	
Actuated g/C Ratio	0.07	0.07		0.14	0.13		0.80	0.79	0.79		0.77	
v/c Ratio	0.05	0.23		0.52	0.32		0.03	0.21	0.03		0.50	
Control Delay	43.6	35.2		47.8	36.6		4.0	4.3	0.2		11.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	43.6	35.2		47.8	36.6		4.0	4.3	0.2		11.4	
LOS	D	D		D	D		A	A	A		B	
Approach Delay		36.5			42.8			4.0			11.4	
Approach LOS		D			D			A			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 68 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 12.2

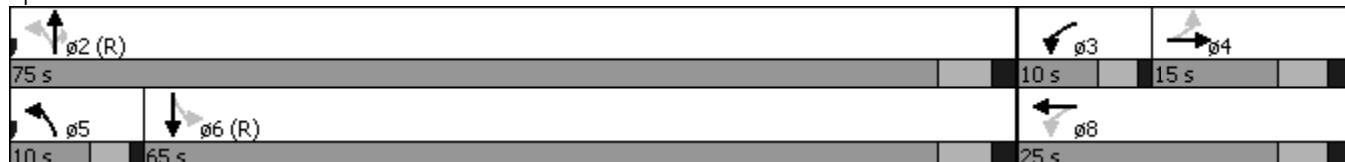
Intersection LOS: B

Intersection Capacity Utilization 61.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	30	5	5	5	5	5	10	150	5	5	470	135
Future Vol, veh/h	30	5	5	5	5	5	10	150	5	5	470	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	650
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	5	5	5	5	5	11	163	5	5	511	147

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	715	712	511	715	710	166	511	0	0	168	0	0
Stage 1	522	522	-	188	188	-	-	-	-	-	-	-
Stage 2	193	190	-	527	522	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	346	358	563	346	359	878	1054	-	-	1410	-	-
Stage 1	538	531	-	814	745	-	-	-	-	-	-	-
Stage 2	809	743	-	535	531	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	336	352	563	334	353	878	1054	-	-	1410	-	-
Mov Cap-2 Maneuver	336	352	-	334	353	-	-	-	-	-	-	-
Stage 1	532	528	-	806	737	-	-	-	-	-	-	-
Stage 2	790	735	-	521	528	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	16.5			13.7			0.5			0.1		
HCM LOS	C			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1054	-	-	356	431	1410	-	-
HCM Lane V/C Ratio	0.01	-	-	0.122	0.038	0.004	-	-
HCM Control Delay (s)	8.5	-	-	16.5	13.7	7.6	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0	-	-

## Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	5	20	10	5	5	25	570	15	20	980	10
Future Vol, veh/h	5	5	20	10	5	5	25	570	15	20	980	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	22	11	5	5	27	620	16	22	1065	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1481	1804	538	1261	1802	318	1076	0	0	636	0	0
Stage 1	1114	1114	-	682	682	-	-	-	-	-	-	-
Stage 2	367	690	-	579	1120	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	87	79	488	127	79	678	644	-	-	943	-	-
Stage 1	222	282	-	406	448	-	-	-	-	-	-	-
Stage 2	625	444	-	468	280	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	78	74	488	109	74	678	644	-	-	943	-	-
Mov Cap-2 Maneuver	78	74	-	109	74	-	-	-	-	-	-	-
Stage 1	213	275	-	389	429	-	-	-	-	-	-	-
Stage 2	586	425	-	428	273	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	30.4			41.5			0.4			0.2		
HCM LOS	D			E								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	644	-	-	174	120	943	-	-				
HCM Lane V/C Ratio	0.042	-	-	0.187	0.181	0.023	-	-				
HCM Control Delay (s)	10.8	-	-	30.4	41.5	8.9	-	-				
HCM Lane LOS	B	-	-	D	E	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.6	0.1	-	-				

## Timings

113: Main St &amp; 3rd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	90	350	55	155	405	105	65	980	130	105	695	70
Future Volume (vph)	90	350	55	155	405	105	65	980	130	105	695	70
Satd. Flow (prot)	1770	3468	0	1770	3429	0	1770	3476	0	1770	3490	0
Flt Permitted	0.445			0.266			0.268			0.109		
Satd. Flow (perm)	829	3468	0	495	3429	0	499	3476	0	203	3490	0
Satd. Flow (RTOR)		16			36			18			13	
Lane Group Flow (vph)	98	440	0	168	554	0	71	1206	0	114	831	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4			8			2			6	
Total Split (s)	27.0	27.0		14.0	41.0		10.0	49.0		10.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9		4.0	5.2		4.0	5.2	
Act Effct Green (s)	18.0	18.0		33.6	31.7		53.9	46.4		55.7	48.9	
Actuated g/C Ratio	0.18	0.18		0.34	0.32		0.54	0.46		0.56	0.49	
v/c Ratio	0.66	0.69		0.58	0.50		0.20	0.74		0.52	0.49	
Control Delay	59.0	42.7		32.2	27.0		18.9	37.2		19.8	19.3	
Queue Delay	0.0	0.0		0.0	0.4		0.0	0.0		0.0	0.0	
Total Delay	59.0	42.7		32.2	27.5		18.9	37.2		19.8	19.3	
LOS	E	D		C	C		B	D		B	B	
Approach Delay		45.6			28.6			36.2			19.3	
Approach LOS		D			C			D			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 21 (21%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 31.5

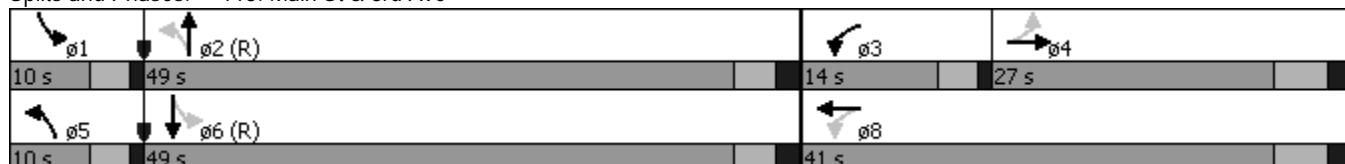
Intersection LOS: C

Intersection Capacity Utilization 74.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Ave



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	290	95	40	45	20	55	1010	75	10	805	45
Future Volume (vph)	140	290	95	40	45	20	55	1010	75	10	805	45
Satd. Flow (prot)	1770	1863	1583	1770	1777	0	1770	3504	0	1770	3511	0
Flt Permitted	0.711			0.264			0.281			0.200		
Satd. Flow (perm)	1324	1863	1583	492	1777	0	523	3504	0	373	3511	0
Satd. Flow (RTOR)			94		21			15			11	
Lane Group Flow (vph)	152	315	103	43	71	0	60	1180	0	11	924	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	30.0	30.0	30.0	30.0	30.0		70.0	70.0		70.0	70.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	21.4	21.4	21.4	21.4	21.4		67.5	67.5		67.5	67.5	
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.68	0.68		0.68	0.68	
v/c Ratio	0.54	0.79	0.25	0.41	0.18		0.17	0.50		0.04	0.39	
Control Delay	41.5	51.6	9.3	45.0	23.6		4.0	4.2		2.8	5.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.5	51.6	9.3	45.0	23.6		4.0	4.3		2.8	5.6	
LOS	D	D	A	D	C		A	A		A	A	
Approach Delay		41.3			31.7			4.2			5.5	
Approach LOS		D			C			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 47 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 13.1

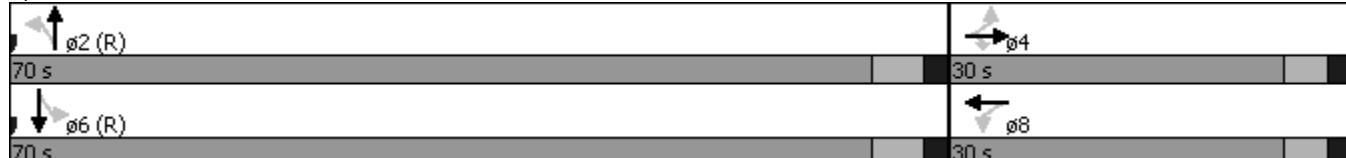
Intersection LOS: B

Intersection Capacity Utilization 73.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↓↓		
Traffic Volume (vph)	15	70	20	35	35	10	20	1065	105	10	965	10
Future Volume (vph)	15	70	20	35	35	10	20	1065	105	10	965	10
Satd. Flow (prot)	1593	1619	0	1593	1619	0	1593	3185	1425	0	3176	0
Flt Permitted	0.725			0.487			0.233				0.939	
Satd. Flow (perm)	1215	1619	0	816	1619	0	391	3185	1425	0	2985	0
Satd. Flow (RTOR)			12			11			114		2	
Lane Group Flow (vph)	16	98	0	38	49	0	22	1158	114	0	1071	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases			4			3	8		5	2		6
Permitted Phases			4			8			2		2	6
Total Split (s)	22.0	22.0		8.0	30.0		9.0	70.0	70.0	61.0	61.0	
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9		5.9	
Act Effct Green (s)	10.7	10.7		16.3	15.3		77.3	76.6	76.6		73.0	
Actuated g/C Ratio	0.11	0.11		0.16	0.15		0.77	0.77	0.77		0.73	
v/c Ratio	0.12	0.54		0.23	0.19		0.06	0.47	0.10		0.49	
Control Delay	40.5	47.0		35.1	28.8		5.6	7.2	1.4		6.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	40.5	47.0		35.1	28.8		5.6	7.2	1.4		6.3	
LOS	D	D		D	C		A	A	A		A	
Approach Delay		46.1			31.6			6.6			6.3	
Approach LOS		D			C			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 39 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 9.1

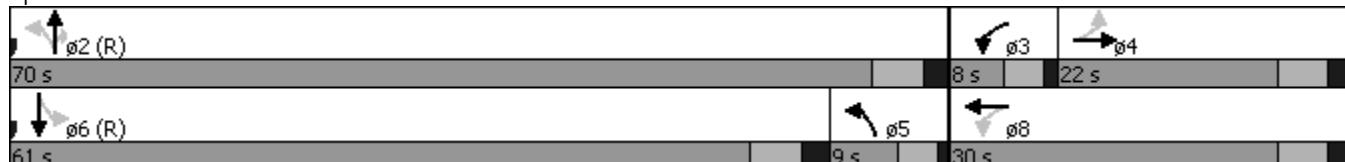
Intersection LOS: A

Intersection Capacity Utilization 57.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	95	5	25	5	5	5	5	500	5	5	380	70
Future Vol, veh/h	95	5	25	5	5	5	5	500	5	5	380	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	620
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	103	5	27	5	5	5	5	543	5	5	413	76

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	987	984	413	997	981	546	413	0	0	549	0	0
Stage 1	424	424	-	557	557	-	-	-	-	-	-	-
Stage 2	563	560	-	440	424	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	226	248	639	223	249	538	1146	-	-	1021	-	-
Stage 1	608	587	-	515	512	-	-	-	-	-	-	-
Stage 2	511	511	-	596	587	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	218	245	639	208	246	538	1146	-	-	1021	-	-
Mov Cap-2 Maneuver	218	245	-	208	246	-	-	-	-	-	-	-
Stage 1	605	583	-	513	510	-	-	-	-	-	-	-
Stage 2	498	509	-	561	583	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34.8	18.7	0.1	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1146	-	-	252	280	1021	-	-
HCM Lane V/C Ratio	0.005	-	-	0.539	0.058	0.005	-	-
HCM Control Delay (s)	8.2	-	-	34.8	18.7	8.5	0	-
HCM Lane LOS	A	-	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.9	0.2	0	-	-

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	5	15	10	5	25	40	1105	10	15	930	10
Future Vol, veh/h	5	5	15	10	5	25	40	1105	10	15	930	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	16	11	5	27	43	1201	11	16	1011	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1739	2348	511	1834	2347	606	1022	0	0	1212	0	0
Stage 1	1049	1049	-	1293	1293	-	-	-	-	-	-	-
Stage 2	690	1299	-	541	1054	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	56	36	508	47	36	440	675	-	-	571	-	-
Stage 1	243	303	-	172	231	-	-	-	-	-	-	-
Stage 2	401	230	-	493	301	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	43	33	508	37	33	440	675	-	-	571	-	-
Mov Cap-2 Maneuver	43	33	-	37	33	-	-	-	-	-	-	-
Stage 1	228	295	-	161	216	-	-	-	-	-	-	-
Stage 2	343	215	-	455	293	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	67.1	86.8	0.4	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	675	-	-	84	84	571	-	-
HCM Lane V/C Ratio	0.064	-	-	0.323	0.518	0.029	-	-
HCM Control Delay (s)	10.7	-	-	67.1	86.8	11.5	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.2	2.2	0.1	-	-

## Timings

113: Main St &amp; 3rd Avenue

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑	↑	↑	↑↑		↑	↑↑	
Traffic Volume (vph)	20	165	30	200	540	65	45	415	95	90	900	90
Future Volume (vph)	20	165	30	200	540	65	45	415	95	90	900	90
Satd. Flow (prot)	1770	3458	0	1770	3539	1583	1770	3440	0	1770	3490	0
Flt Permitted	0.431				0.462			0.197			0.408	
Satd. Flow (perm)	803	3458	0	861	3539	1583	367	3440	0	760	3490	0
Satd. Flow (RTOR)		19				68		35			13	
Lane Group Flow (vph)	22	212	0	217	587	71	49	554	0	98	1076	0
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4			8		8	2			6	
Total Split (s)	27.0	27.0		12.0	39.0	39.0	12.0	49.0		12.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9	5.9	4.0	5.2		4.0	5.2	
Act Effct Green (s)	11.8	11.8		25.7	23.8	23.8	62.1	55.5		64.0	56.4	
Actuated g/C Ratio	0.12	0.12		0.26	0.24	0.24	0.62	0.56		0.64	0.56	
v/c Ratio	0.23	0.50		0.74	0.70	0.17	0.15	0.29		0.17	0.54	
Control Delay	44.1	40.8		47.2	39.2	8.5	6.3	12.2		7.6	16.1	
Queue Delay	0.0	0.0		0.0	0.1	0.0	0.0	0.0		0.0	0.0	
Total Delay	44.1	40.8		47.2	39.3	8.5	6.3	12.2		7.6	16.1	
LOS	D	D		D	D	A	A	B		A	B	
Approach Delay		41.1			38.7			11.8			15.4	
Approach LOS		D			D			B			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 25 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 23.8

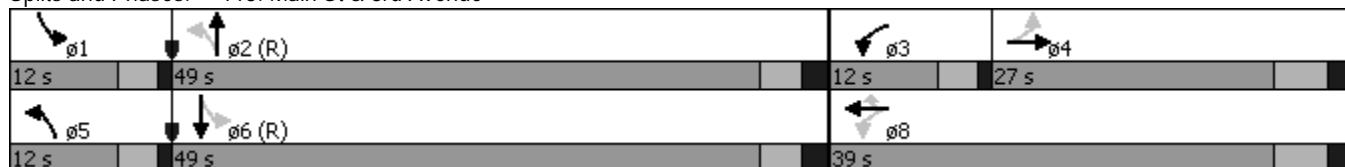
Intersection LOS: C

Intersection Capacity Utilization 67.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Avenue



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↗ ↙	↑ ↗	↑ ↘	↗ ↙	↑ ↗	↑ ↘	↗ ↙	↑ ↗	↑ ↘	↗ ↙
Traffic Volume (vph)	80	140	90	85	115	20	40	600	40	25	895	55
Future Volume (vph)	80	140	90	85	115	20	40	600	40	25	895	55
Satd. Flow (prot)	1770	1863	1583	1770	1822	0	1770	3507	0	1770	3507	0
Flt Permitted	0.532			0.515			0.261			0.386		
Satd. Flow (perm)	991	1863	1583	959	1822	0	486	3507	0	719	3507	0
Satd. Flow (RTOR)				98		7		19				17
Lane Group Flow (vph)	87	152	98	92	147	0	43	695	0	27	1033	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Total Split (s)	20.0	20.0	20.0	20.0	20.0		80.0	80.0		80.0	80.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	12.9	12.9	12.9	12.9	12.9		76.0	76.0		76.0	76.0	
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13		0.76	0.76		0.76	0.76	
v/c Ratio	0.69	0.63	0.34	0.75	0.61		0.12	0.26		0.05	0.39	
Control Delay	67.9	53.2	11.4	76.2	50.0		4.3	3.8		1.3	4.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	67.9	53.2	11.4	76.2	50.0		4.3	3.8		1.3	4.3	
LOS	E	D	B	E	D		A	A		A	A	
Approach Delay		44.8			60.0			3.9			4.2	
Approach LOS		D			E			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 45 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 15.5

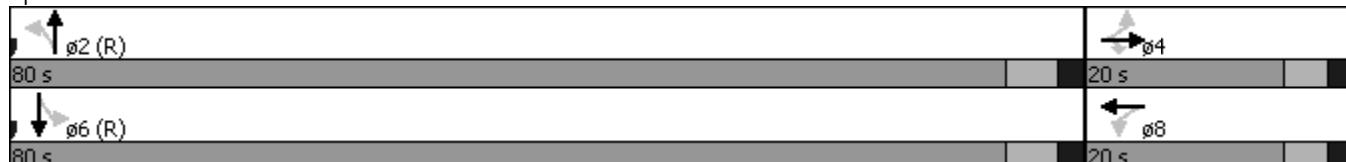
Intersection LOS: B

Intersection Capacity Utilization 58.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↔	↔	
Traffic Volume (vph)	5	20	10	140	55	25	10	510	40	30	1040	25
Future Volume (vph)	5	20	10	140	55	25	10	510	40	30	1040	25
Satd. Flow (prot)	1593	1593	0	1593	1598	0	1593	3185	1425	0	3173	0
Flt Permitted	0.833			0.455			0.186				0.925	
Satd. Flow (perm)	1397	1593	0	763	1598	0	312	3185	1425	0	2938	0
Satd. Flow (RTOR)			11			20			72			4
Lane Group Flow (vph)	5	33	0	152	87	0	11	554	43	0	1190	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases			4		3	8		5	2			6
Permitted Phases			4			8		2		2		6
Total Split (s)	15.0	15.0		10.0	25.0		11.0	75.0	75.0	64.0	64.0	
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9			5.9
Act Effct Green (s)	7.1	7.1		15.1	13.5		76.9	75.0	75.0			73.0
Actuated g/C Ratio	0.07	0.07		0.15	0.14		0.77	0.75	0.75			0.73
v/c Ratio	0.05	0.27		0.88	0.38		0.04	0.23	0.04			0.55
Control Delay	43.2	37.8		83.7	33.2		4.2	4.7	0.5			13.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0			0.1
Total Delay	43.2	37.8		83.7	33.2		4.2	4.7	0.5			13.8
LOS	D	D		F	C		A	A	A			B
Approach Delay		38.5			65.3			4.4				13.8
Approach LOS		D			E			A				B

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 68 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 17.4

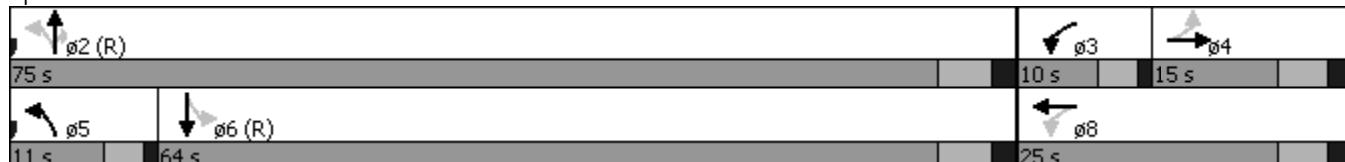
Intersection LOS: B

Intersection Capacity Utilization 79.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	30	5	60	5	5	5	30	145	5	5	465	135
Future Vol, veh/h	30	5	60	5	5	5	30	145	5	5	465	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	650
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	5	65	5	5	5	33	158	5	5	505	147

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	747	744	505	778	742	160	505	0	0	163	0	0
Stage 1	516	516	-	226	226	-	-	-	-	-	-	-
Stage 2	231	228	-	552	516	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	329	343	567	314	344	885	1060	-	-	1416	-	-
Stage 1	542	534	-	777	717	-	-	-	-	-	-	-
Stage 2	772	715	-	518	534	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	314	330	567	267	331	885	1060	-	-	1416	-	-
Mov Cap-2 Maneuver	314	330	-	267	331	-	-	-	-	-	-	-
Stage 1	525	531	-	753	695	-	-	-	-	-	-	-
Stage 2	738	693	-	451	531	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	15.7			14.9			1.4			0.1		
HCM LOS	C			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1060	-	-	439	380	1416	-	-
HCM Lane V/C Ratio	0.031	-	-	0.235	0.043	0.004	-	-
HCM Control Delay (s)	8.5	-	-	15.7	14.9	7.6	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	0.1	0	-	-

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	5	20	10	5	5	25	595	15	20	1055	10
Future Vol, veh/h	5	5	20	10	5	5	25	595	15	20	1055	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	22	11	5	5	27	647	16	22	1147	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1576	1913	579	1329	1910	332	1158	0	0	663	0	0
Stage 1	1196	1196	-	709	709	-	-	-	-	-	-	-
Stage 2	380	717	-	620	1201	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	74	67	458	113	67	664	599	-	-	922	-	-
Stage 1	198	258	-	391	435	-	-	-	-	-	-	-
Stage 2	614	432	-	442	256	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	65	62	458	95	62	664	599	-	-	922	-	-
Mov Cap-2 Maneuver	65	62	-	95	62	-	-	-	-	-	-	-
Stage 1	189	252	-	373	415	-	-	-	-	-	-	-
Stage 2	574	413	-	402	250	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	35.8	49.1	0.4	0.2
HCM LOS	E	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	599	-	-	149	103	922	-	-
HCM Lane V/C Ratio	0.045	-	-	0.219	0.211	0.024	-	-
HCM Control Delay (s)	11.3	-	-	35.8	49.1	9	-	-
HCM Lane LOS	B	-	-	E	E	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0.7	0.1	-	-

## Timings

113: Main St &amp; 3rd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	90	350	55	155	405	105	65	1010	130	105	745	70
Future Volume (vph)	90	350	55	155	405	105	65	1010	130	105	745	70
Satd. Flow (prot)	1770	3468	0	1770	3429	0	1770	3479	0	1770	3493	0
Flt Permitted	0.445			0.266			0.244			0.099		
Satd. Flow (perm)	829	3468	0	495	3429	0	455	3479	0	184	3493	0
Satd. Flow (RTOR)		16			36			18			12	
Lane Group Flow (vph)	98	440	0	168	554	0	71	1239	0	114	886	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4			8			2			6	
Total Split (s)	27.0	27.0		14.0	41.0		10.0	49.0		10.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9		4.0	5.2		4.0	5.2	
Act Effct Green (s)	18.0	18.0		33.6	31.7		53.8	46.3		55.7	48.9	
Actuated g/C Ratio	0.18	0.18		0.34	0.32		0.54	0.46		0.56	0.49	
v/c Ratio	0.66	0.69		0.58	0.50		0.22	0.76		0.54	0.52	
Control Delay	59.0	42.7		32.2	27.0		18.2	37.5		22.0	19.8	
Queue Delay	0.0	0.0		0.0	0.4		0.0	0.0		0.0	0.0	
Total Delay	59.0	42.7		32.2	27.5		18.2	37.5		22.0	19.8	
LOS	E	D		C	C		B	D		C	B	
Approach Delay		45.6			28.6			36.5			20.1	
Approach LOS		D			C			D			C	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 21 (21%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 31.7

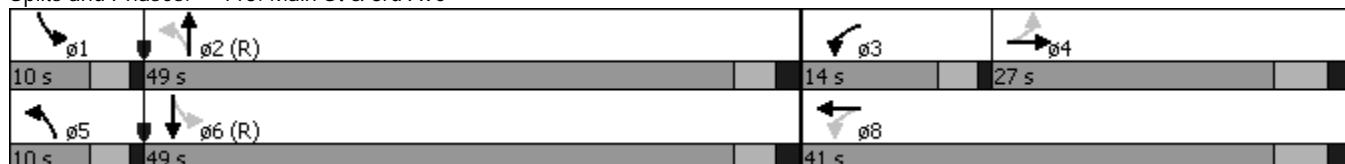
Intersection LOS: C

Intersection Capacity Utilization 74.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Ave



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	310	95	70	55	35	60	1025	90	55	810	45
Future Volume (vph)	140	310	95	70	55	35	60	1025	90	55	810	45
Satd. Flow (prot)	1770	1863	1583	1770	1755	0	1770	3497	0	1770	3511	0
Flt Permitted	0.694			0.240			0.277			0.189		
Satd. Flow (perm)	1293	1863	1583	447	1755	0	516	3497	0	352	3511	0
Satd. Flow (RTOR)				88		30		18				11
Lane Group Flow (vph)	152	337	103	76	98	0	65	1212	0	60	929	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	30.0	30.0	30.0	30.0	30.0		70.0	70.0		70.0	70.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	22.3	22.3	22.3	22.3	22.3		66.6	66.6		66.6	66.6	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22		0.67	0.67		0.67	0.67	
v/c Ratio	0.53	0.81	0.24	0.77	0.24		0.19	0.52		0.26	0.40	
Control Delay	40.7	52.5	10.3	80.9	22.9		4.3	3.8		6.7	5.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.7	52.5	10.3	80.9	22.9		4.3	3.9		6.7	5.8	
LOS	D	D	B	F	C		A	A		A	A	
Approach Delay		42.1			48.2			3.9			5.9	
Approach LOS		D			D			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 47 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 14.5

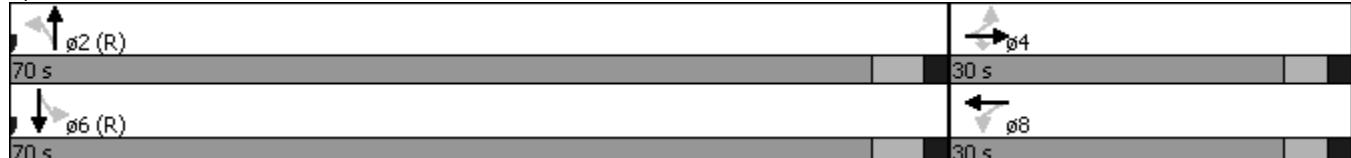
Intersection LOS: B

Intersection Capacity Utilization 75.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↗ ↘	↙ ↖	↑ ↗	↗ ↘	↙ ↖	↑ ↗	↗ ↘	↙ ↖	↖ ↙	↗ ↘	↙ ↖
Traffic Volume (vph)	15	90	20	65	35	30	20	1115	140	25	990	10
Future Volume (vph)	15	90	20	65	35	30	20	1115	140	25	990	10
Satd. Flow (prot)	1593	1630	0	1593	1559	0	1593	3185	1425	0	3179	0
Flt Permitted	0.711			0.476			0.211				0.894	
Satd. Flow (perm)	1192	1630	0	798	1559	0	354	3185	1425	0	2845	0
Satd. Flow (RTOR)		10			33				152		2	
Lane Group Flow (vph)	16	120	0	71	71	0	22	1212	152	0	1114	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			3	8		5	2		6	
Permitted Phases	4				8			2		2	6	
Total Split (s)	21.0	21.0			9.0	30.0		9.0	70.0	70.0	61.0	61.0
Total Lost Time (s)	5.6	5.6			4.0	5.6		4.0	5.9	5.9	5.9	
Act Effct Green (s)	11.7	11.7			20.5	18.9		71.5	69.6	69.6	66.0	
Actuated g/C Ratio	0.12	0.12			0.20	0.19		0.72	0.70	0.70	0.66	
v/c Ratio	0.11	0.60			0.35	0.22		0.07	0.55	0.15	0.59	
Control Delay	39.5	50.3			35.5	20.5		6.5	9.5	1.5	8.1	
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	39.5	50.3			35.5	20.5		6.5	9.5	1.5	8.1	
LOS	D	D			D	C		A	A	A	A	
Approach Delay		49.1				28.0			8.6		8.1	
Approach LOS		D				C		A		A		

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 39 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 11.4

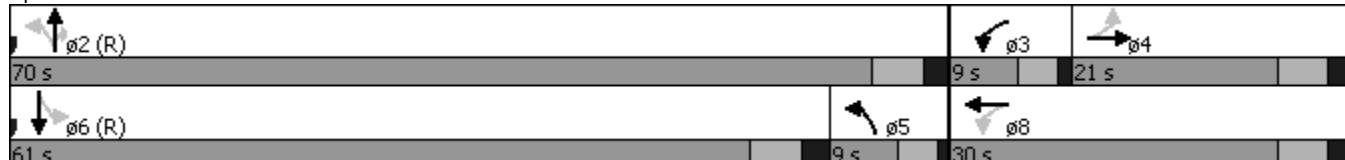
Intersection LOS: B

Intersection Capacity Utilization 71.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 10.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	95	5	80	5	5	5	95	470	5	5	365	70
Future Vol, veh/h	95	5	80	5	5	5	95	470	5	5	365	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	620
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	103	5	87	5	5	5	103	511	5	5	397	76

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1134	1131	397	1174	1128	514	397	0	0	516	0	0
Stage 1	408	408	-	720	720	-	-	-	-	-	-	-
Stage 2	726	723	-	454	408	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	180	203	652	169	204	560	1162	-	-	1050	-	-
Stage 1	620	597	-	419	432	-	-	-	-	-	-	-
Stage 2	416	431	-	586	597	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	162	184	652	133	185	560	1162	-	-	1050	-	-
Mov Cap-2 Maneuver	162	184	-	133	185	-	-	-	-	-	-	-
Stage 1	565	593	-	382	394	-	-	-	-	-	-	-
Stage 2	370	393	-	500	593	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	60.7			24.2			1.4			0.1		
HCM LOS	F			C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1162	-	-	244	204	1050	-	-
HCM Lane V/C Ratio	0.089	-	-	0.802	0.08	0.005	-	-
HCM Control Delay (s)	8.4	-	-	60.7	24.2	8.4	0	-
HCM Lane LOS	A	-	-	F	C	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	6.1	0.3	0	-	-

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	5	15	10	5	25	40	1190	10	15	985	10
Future Vol, veh/h	5	5	15	10	5	25	40	1190	10	15	985	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	16	11	5	27	43	1293	11	16	1071	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1845	2500	541	1957	2500	652	1082	0	0	1304	0	0
Stage 1	1109	1109	-	1386	1386	-	-	-	-	-	-	-
Stage 2	736	1391	-	571	1114	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	46	28	485	38	28	411	640	-	-	527	-	-
Stage 1	223	283	-	151	209	-	-	-	-	-	-	-
Stage 2	377	207	-	473	282	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	33	25	485	28	25	411	640	-	-	527	-	-
Mov Cap-2 Maneuver	33	25	-	28	25	-	-	-	-	-	-	-
Stage 1	208	274	-	141	195	-	-	-	-	-	-	-
Stage 2	319	193	-	434	273	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	95.5			135			0.4			0.2		
HCM LOS	F			F								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	640	-	-	65	65	527	-	-
HCM Lane V/C Ratio	0.068	-	-	0.418	0.669	0.031	-	-
HCM Control Delay (s)	11	-	-	95.5	135	12	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.6	2.9	0.1	-	-

## Timings

113: Main St &amp; 3rd Avenue

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑	↑	↑	↑↑		↑	↑↑	
Traffic Volume (vph)	20	165	30	200	540	65	45	415	95	90	900	90
Future Volume (vph)	20	165	30	200	540	65	45	415	95	90	900	90
Satd. Flow (prot)	1770	3458	0	1770	3539	1583	1770	3440	0	1770	3490	0
Flt Permitted	0.431							0.197			0.408	
Satd. Flow (perm)	803	3458	0	861	3539	1583	367	3440	0	760	3490	0
Satd. Flow (RTOR)		19				68		35			13	
Lane Group Flow (vph)	22	212	0	217	587	71	49	554	0	98	1076	0
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4				8		8	2			6
Total Split (s)	27.0	27.0		12.0	39.0	39.0	12.0	49.0		12.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9	5.9	4.0	5.2		4.0	5.2	
Act Effct Green (s)	11.8	11.8		25.7	23.8	23.8	62.1	55.5		64.0	56.4	
Actuated g/C Ratio	0.12	0.12		0.26	0.24	0.24	0.62	0.56		0.64	0.56	
v/c Ratio	0.23	0.50		0.74	0.70	0.17	0.15	0.29		0.17	0.54	
Control Delay	44.1	40.8		47.2	39.2	8.5	6.2	12.6		7.6	16.1	
Queue Delay	0.0	0.0		0.0	0.1	0.0	0.0	0.0		0.0	0.0	
Total Delay	44.1	40.8		47.2	39.3	8.5	6.2	12.6		7.6	16.1	
LOS	D	D		D	D	A	A	B		A	B	
Approach Delay		41.1			38.7			12.0			15.4	
Approach LOS		D			D			B			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 25 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 23.9

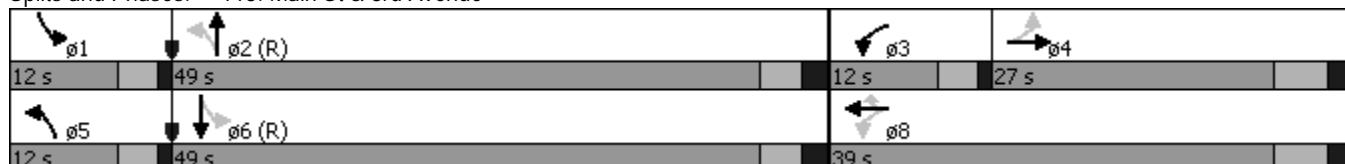
Intersection LOS: C

Intersection Capacity Utilization 67.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Avenue



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBC	WBL	WBT	WBC	NBL	NBT	NBC	SBL	SBT	SBC
Lane Configurations												
Traffic Volume (vph)	80	140	90	145	115	30	40	590	45	30	890	55
Future Volume (vph)	80	140	90	145	115	30	40	590	45	30	890	55
Satd. Flow (prot)	1770	1863	1583	1770	1805	0	1770	3500	0	1770	3507	0
Flt Permitted	0.524			0.542			0.259			0.386		
Satd. Flow (perm)	976	1863	1583	1010	1805	0	482	3500	0	719	3507	0
Satd. Flow (RTOR)				98		11			22			17
Lane Group Flow (vph)	87	152	98	158	158	0	43	690	0	33	1027	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	20.0	20.0	20.0	20.0	20.0		80.0	80.0		80.0	80.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	14.8	14.8	14.8	14.8	14.8		74.1	74.1		74.1	74.1	
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15		0.74	0.74		0.74	0.74	
v/c Ratio	0.60	0.55	0.31	1.06	0.57		0.12	0.27		0.06	0.39	
Control Delay	58.9	48.0	10.8	133.8	45.9		4.5	4.2		1.5	5.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	58.9	48.0	10.8	133.8	45.9		4.5	4.2		1.5	5.1	
LOS	E	D	B	F	D		A	A		A	A	
Approach Delay		40.0			89.8			4.2			4.9	
Approach LOS		D			F			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 45 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 20.5

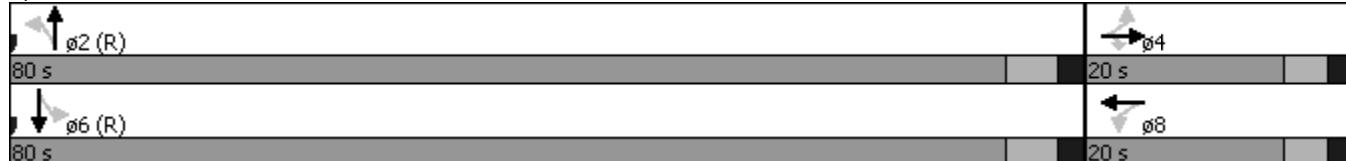
Intersection LOS: C

Intersection Capacity Utilization 62.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↔↔		
Traffic Volume (vph)	10	15	10	80	55	15	10	520	30	25	1100	25
Future Volume (vph)	10	15	10	80	55	15	10	520	30	25	1100	25
Satd. Flow (prot)	1593	1574	0	1593	1623	0	1593	3185	1425	0	3173	0
Flt Permitted	0.889			0.471			0.175				0.933	
Satd. Flow (perm)	1490	1574	0	790	1623	0	293	3185	1425	0	2963	0
Satd. Flow (RTOR)		11			12				72		4	
Lane Group Flow (vph)	11	27	0	87	76	0	11	565	33	0	1250	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			3	8		5	2		6	
Permitted Phases	4				8			2		2	6	
Total Split (s)	15.0	15.0		10.0	25.0		10.0	75.0	75.0	65.0	65.0	
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9		5.9	
Act Effct Green (s)	6.7	6.7		14.6	13.2		79.4	78.7	78.7		76.7	
Actuated g/C Ratio	0.07	0.07		0.15	0.13		0.79	0.79	0.79		0.77	
v/c Ratio	0.11	0.23		0.52	0.34		0.04	0.23	0.03		0.55	
Control Delay	45.3	35.2		47.7	35.4		4.0	4.3	0.2		14.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.1	
Total Delay	45.3	35.2		47.7	35.4		4.0	4.3	0.2		14.3	
LOS	D	D		D	D		A	A	A		B	
Approach Delay		38.1			42.0			4.1			14.3	
Approach LOS		D			D			A			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 68 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 13.9

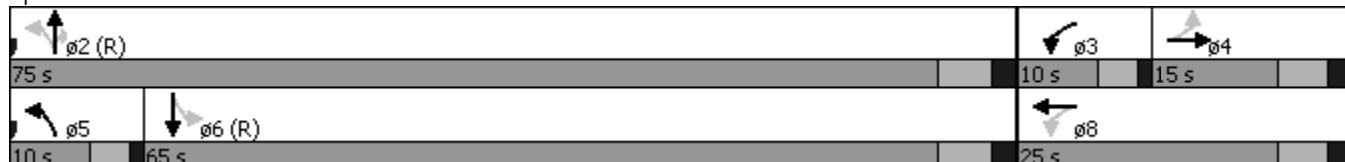
Intersection LOS: B

Intersection Capacity Utilization 75.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	30	5	20	5	5	5	15	160	5	5	505	135
Future Vol, veh/h	30	5	20	5	5	5	15	160	5	5	505	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	650
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	5	22	5	5	5	16	174	5	5	549	147

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	775	772	549	782	769	177	549	0	0	179	0	0
Stage 1	560	560	-	209	209	-	-	-	-	-	-	-
Stage 2	215	212	-	573	560	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	315	330	535	312	332	866	1021	-	-	1397	-	-
Stage 1	513	511	-	793	729	-	-	-	-	-	-	-
Stage 2	787	727	-	505	511	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	304	323	535	291	325	866	1021	-	-	1397	-	-
Mov Cap-2 Maneuver	304	323	-	291	325	-	-	-	-	-	-	-
Stage 1	505	508	-	781	718	-	-	-	-	-	-	-
Stage 2	764	716	-	476	508	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.9	14.6	0.7	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1021	-	-	363	391	1397	-	-
HCM Lane V/C Ratio	0.016	-	-	0.165	0.042	0.004	-	-
HCM Control Delay (s)	8.6	-	-	16.9	14.6	7.6	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.1	0	-	-

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	5	20	10	5	5	25	595	15	20	1055	10
Future Vol, veh/h	5	5	20	10	5	5	25	595	15	20	1055	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	22	11	5	5	27	647	16	22	1147	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1576	1913	579	1329	1910	332	1158	0	0	663	0	0
Stage 1	1196	1196	-	709	709	-	-	-	-	-	-	-
Stage 2	380	717	-	620	1201	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	74	67	458	113	67	664	599	-	-	922	-	-
Stage 1	198	258	-	391	435	-	-	-	-	-	-	-
Stage 2	614	432	-	442	256	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	65	62	458	95	62	664	599	-	-	922	-	-
Mov Cap-2 Maneuver	65	62	-	95	62	-	-	-	-	-	-	-
Stage 1	189	252	-	373	415	-	-	-	-	-	-	-
Stage 2	574	413	-	402	250	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	35.8	49.1	0.4	0.2
HCM LOS	E	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	599	-	-	149	103	922	-	-
HCM Lane V/C Ratio	0.045	-	-	0.219	0.211	0.024	-	-
HCM Control Delay (s)	11.3	-	-	35.8	49.1	9	-	-
HCM Lane LOS	B	-	-	E	E	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0.7	0.1	-	-

## Timings

113: Main St &amp; 3rd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	90	350	55	155	405	105	65	1010	130	105	745	70
Future Volume (vph)	90	350	55	155	405	105	65	1010	130	105	745	70
Satd. Flow (prot)	1770	3468	0	1770	3429	0	1770	3479	0	1770	3493	0
Flt Permitted	0.445			0.266			0.244			0.099		
Satd. Flow (perm)	829	3468	0	495	3429	0	455	3479	0	184	3493	0
Satd. Flow (RTOR)		16			36			18			12	
Lane Group Flow (vph)	98	440	0	168	554	0	71	1239	0	114	886	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4			8			2			6	
Total Split (s)	27.0	27.0		14.0	41.0		10.0	49.0		10.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9		4.0	5.2		4.0	5.2	
Act Effct Green (s)	18.0	18.0		33.6	31.7		53.8	46.3		55.7	48.9	
Actuated g/C Ratio	0.18	0.18		0.34	0.32		0.54	0.46		0.56	0.49	
v/c Ratio	0.66	0.69		0.58	0.50		0.22	0.76		0.54	0.52	
Control Delay	59.0	42.7		32.2	27.0		19.1	38.3		22.0	19.8	
Queue Delay	0.0	0.0		0.0	0.4		0.0	0.0		0.0	0.0	
Total Delay	59.0	42.7		32.2	27.5		19.1	38.3		22.0	19.8	
LOS	E	D		C	C		B	D		C	B	
Approach Delay		45.6			28.6			37.3			20.1	
Approach LOS		D			C			D			C	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 21 (21%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 32.0

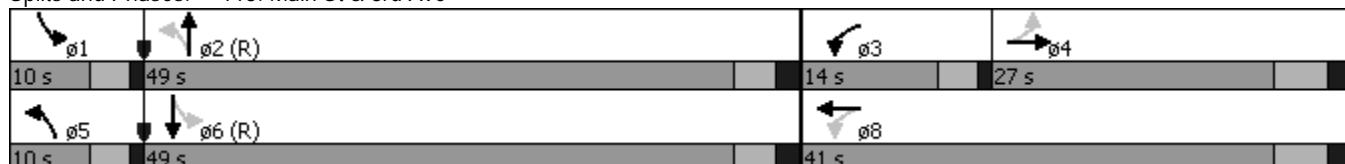
Intersection LOS: C

Intersection Capacity Utilization 74.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Ave



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBC	WBL	WBT	WBC	NBL	NBT	NBC	SBL	SBT	SBC
Lane Configurations												
Traffic Volume (vph)	140	310	100	100	55	45	60	1015	110	60	805	45
Future Volume (vph)	140	310	100	100	55	45	60	1015	110	60	805	45
Satd. Flow (prot)	1770	1863	1583	1770	1738	0	1770	3486	0	1770	3511	0
Flt Permitted	0.687			0.250			0.278			0.184		
Satd. Flow (perm)	1280	1863	1583	466	1738	0	518	3486	0	343	3511	0
Satd. Flow (RTOR)			93		39			23			11	
Lane Group Flow (vph)	152	337	109	109	109	0	65	1223	0	65	924	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Total Split (s)	30.0	30.0	30.0	30.0	30.0		70.0	70.0		70.0	70.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	22.8	22.8	22.8	22.8	22.8		66.1	66.1		66.1	66.1	
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23		0.66	0.66		0.66	0.66	
v/c Ratio	0.52	0.79	0.25	1.03	0.26		0.19	0.53		0.29	0.40	
Control Delay	40.1	50.4	10.2	135.8	21.4		4.3	4.7		8.0	6.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.1	50.4	10.2	135.8	21.4		4.3	4.8		8.0	6.1	
LOS	D	D	B	F	C		A	A		A	A	
Approach Delay		40.5			78.6			4.8			6.2	
Approach LOS		D			E			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 47 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 17.3

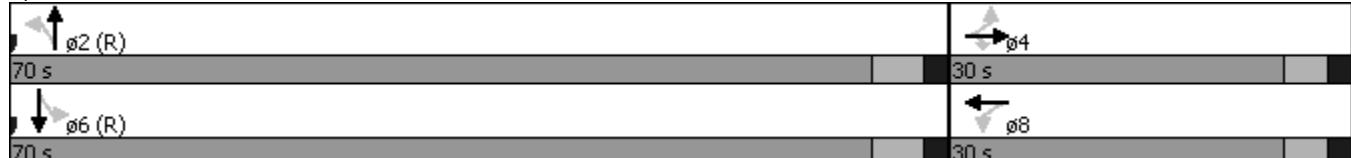
Intersection LOS: B

Intersection Capacity Utilization 76.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↔↔		
Traffic Volume (vph)	35	70	20	35	35	10	20	1150	105	20	1020	10
Future Volume (vph)	35	70	20	35	35	10	20	1150	105	20	1020	10
Satd. Flow (prot)	1593	1619	0	1593	1619	0	1593	3185	1425	0	3179	0
Flt Permitted	0.725			0.487			0.212				0.909	
Satd. Flow (perm)	1215	1619	0	816	1619	0	355	3185	1425	0	2893	0
Satd. Flow (RTOR)			12			11			114		1	
Lane Group Flow (vph)	38	98	0	38	49	0	22	1250	114	0	1142	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			3	8		5	2		6	
Permitted Phases		4				8		2		2	6	
Total Split (s)	22.0	22.0			8.0	30.0		9.0	70.0	70.0	61.0	61.0
Total Lost Time (s)	5.6	5.6			4.0	5.6		4.0	5.9	5.9		5.9
Act Effct Green (s)	10.7	10.7			16.3	15.3		77.3	76.6	76.6		73.0
Actuated g/C Ratio	0.11	0.11			0.16	0.15		0.77	0.77	0.77		0.73
v/c Ratio	0.29	0.54			0.23	0.19		0.07	0.51	0.10		0.54
Control Delay	45.6	47.0			35.1	28.8		5.8	7.6	1.4		6.4
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay	45.6	47.0			35.1	28.8		5.8	7.6	1.4		6.4
LOS	D	D			D	C		A	A	A		A
Approach Delay		46.6				31.6			7.1		6.4	
Approach LOS		D				C		A		A		

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 39 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 9.5

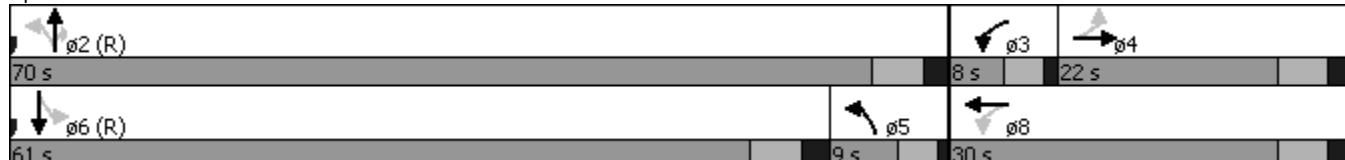
Intersection LOS: A

Intersection Capacity Utilization 65.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	95	5	35	5	5	5	15	550	5	5	410	70
Future Vol, veh/h	95	5	35	5	5	5	15	550	5	5	410	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	620
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	103	5	38	5	5	5	16	598	5	5	446	76

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1096	1093	446	1111	1090	601	446	0	0	603	0	0
Stage 1	457	457	-	633	633	-	-	-	-	-	-	-
Stage 2	639	636	-	478	457	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	191	214	612	186	215	500	1114	-	-	975	-	-
Stage 1	583	568	-	468	473	-	-	-	-	-	-	-
Stage 2	464	472	-	568	568	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	182	209	612	168	210	500	1114	-	-	975	-	-
Mov Cap-2 Maneuver	182	209	-	168	210	-	-	-	-	-	-	-
Stage 1	575	564	-	461	466	-	-	-	-	-	-	-
Stage 2	447	465	-	524	564	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	47.2	21.4	0.2	0.1
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1114	-	-	224	236	975	-	-
HCM Lane V/C Ratio	0.015	-	-	0.655	0.069	0.006	-	-
HCM Control Delay (s)	8.3	-	-	47.2	21.4	8.7	0	-
HCM Lane LOS	A	-	-	E	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	4	0.2	0	-	-

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	5	15	10	5	25	40	1190	10	15	985	10
Future Vol, veh/h	5	5	15	10	5	25	40	1190	10	15	985	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	16	11	5	27	43	1293	11	16	1071	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1845	2500	541	1957	2500	652	1082	0	0	1304	0	0
Stage 1	1109	1109	-	1386	1386	-	-	-	-	-	-	-
Stage 2	736	1391	-	571	1114	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	46	28	485	38	28	411	640	-	-	527	-	-
Stage 1	223	283	-	151	209	-	-	-	-	-	-	-
Stage 2	377	207	-	473	282	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	33	25	485	28	25	411	640	-	-	527	-	-
Mov Cap-2 Maneuver	33	25	-	28	25	-	-	-	-	-	-	-
Stage 1	208	274	-	141	195	-	-	-	-	-	-	-
Stage 2	319	193	-	434	273	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	95.5			135			0.4			0.2		
HCM LOS	F			F								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	640	-	-	65	65	527	-	-
HCM Lane V/C Ratio	0.068	-	-	0.418	0.669	0.031	-	-
HCM Control Delay (s)	11	-	-	95.5	135	12	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.6	2.9	0.1	-	-

## Timings

6: Main St &amp; Boston Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	5	10	20	20	10	10	25	595	30	40	1055	10
Future Volume (vph)	5	10	20	20	10	10	25	595	30	40	1055	10
Satd. Flow (prot)	1770	1676	0	1770	1723	0	1770	3514	0	1770	3536	0
Flt Permitted	0.816			0.816			0.237			0.393		
Satd. Flow (perm)	1520	1676	0	1520	1723	0	441	3514	0	732	3536	0
Satd. Flow (RTOR)		22			11			12			2	
Lane Group Flow (vph)	5	33	0	22	22	0	27	680	0	43	1158	0
Turn Type	Perm	NA										
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	25.0	25.0		25.0	25.0		75.0	75.0		75.0	75.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Act Effct Green (s)	7.1	7.1		7.2	7.2		89.1	89.1		89.1	89.1	
Actuated g/C Ratio	0.07	0.07		0.07	0.07		0.89	0.89		0.89	0.89	
v/c Ratio	0.05	0.24		0.20	0.16		0.07	0.22		0.07	0.37	
Control Delay	42.8	27.0		47.1	31.4		2.2	1.6		0.5	0.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	42.8	27.0		47.1	31.4		2.2	1.6		0.5	0.5	
LOS	D	C		D	C		A	A		A	A	
Approach Delay		29.0			39.3			1.6			0.5	
Approach LOS		C			D			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 74 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 2.3

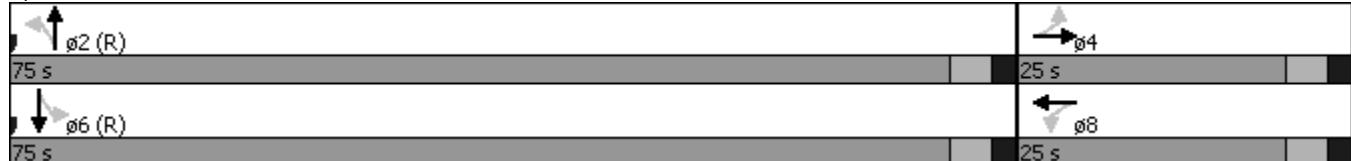
Intersection LOS: A

Intersection Capacity Utilization 49.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 6: Main St &amp; Boston Ave



## Timings

113: Main St &amp; 3rd Avenue

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑	↑	↑	↑↑		↑	↑↑	
Traffic Volume (vph)	20	165	30	200	540	65	45	410	95	90	900	90
Future Volume (vph)	20	165	30	200	540	65	45	410	95	90	900	90
Satd. Flow (prot)	1770	3458	0	1770	3539	1583	1770	3440	0	1770	3490	0
Flt Permitted	0.431				0.462			0.197			0.411	
Satd. Flow (perm)	803	3458	0	861	3539	1583	367	3440	0	766	3490	0
Satd. Flow (RTOR)		19				68		35			13	
Lane Group Flow (vph)	22	212	0	217	587	71	49	549	0	98	1076	0
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4			8		8	2			6	
Total Split (s)	27.0	27.0		12.0	39.0	39.0	12.0	49.0		12.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9	5.9	4.0	5.2		4.0	5.2	
Act Effct Green (s)	11.8	11.8		25.7	23.8	23.8	62.1	55.5		64.0	56.4	
Actuated g/C Ratio	0.12	0.12		0.26	0.24	0.24	0.62	0.56		0.64	0.56	
v/c Ratio	0.23	0.50		0.74	0.70	0.17	0.15	0.29		0.17	0.54	
Control Delay	44.1	40.8		47.2	39.2	8.5	6.6	11.5		7.6	16.1	
Queue Delay	0.0	0.0		0.0	0.1	0.0	0.0	0.0		0.0	0.0	
Total Delay	44.1	40.8		47.2	39.3	8.5	6.6	11.5		7.6	16.1	
LOS	D	D		D	D	A	A	B		A	B	
Approach Delay		41.1			38.7			11.1			15.4	
Approach LOS		D			D			B			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 25 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 23.7

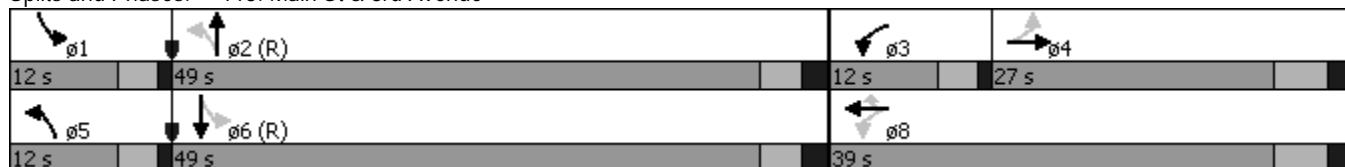
Intersection LOS: C

Intersection Capacity Utilization 67.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Avenue



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBC	WBL	WBT	WBC	NBL	NBT	NBC	SBL	SBT	SBC
Lane Configurations												
Traffic Volume (vph)	80	140	90	85	115	20	40	595	40	25	895	55
Future Volume (vph)	80	140	90	85	115	20	40	595	40	25	895	55
Satd. Flow (prot)	1770	1863	1583	1770	1822	0	1770	3507	0	1770	3507	0
Flt Permitted	0.532			0.515			0.261			0.388		
Satd. Flow (perm)	991	1863	1583	959	1822	0	486	3507	0	723	3507	0
Satd. Flow (RTOR)				98		7		19				17
Lane Group Flow (vph)	87	152	98	92	147	0	43	690	0	27	1033	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Total Split (s)	20.0	20.0	20.0	20.0	20.0		80.0	80.0		80.0	80.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	12.9	12.9	12.9	12.9	12.9		76.0	76.0		76.0	76.0	
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13		0.76	0.76		0.76	0.76	
v/c Ratio	0.69	0.63	0.34	0.75	0.61		0.12	0.26		0.05	0.39	
Control Delay	67.9	53.2	11.4	76.2	50.0		4.3	3.8		1.3	4.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	67.9	53.2	11.4	76.2	50.0		4.3	3.8		1.3	4.3	
LOS	E	D	B	E	D		A	A		A	A	
Approach Delay		44.8			60.0			3.8			4.2	
Approach LOS		D			E			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 45 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 15.5

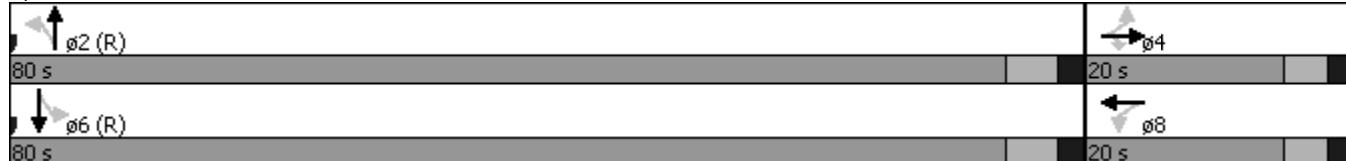
Intersection LOS: B

Intersection Capacity Utilization 58.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↔	↔	
Traffic Volume (vph)	5	20	10	140	55	25	10	510	40	30	1040	25
Future Volume (vph)	5	20	10	140	55	25	10	510	40	30	1040	25
Satd. Flow (prot)	1593	1593	0	1593	1598	0	1593	3185	1425	0	3173	0
Flt Permitted	0.833			0.455			0.186				0.925	
Satd. Flow (perm)	1397	1593	0	763	1598	0	312	3185	1425	0	2938	0
Satd. Flow (RTOR)			11			20			72			4
Lane Group Flow (vph)	5	33	0	152	87	0	11	554	43	0	1190	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases			4		3	8		5	2			6
Permitted Phases			4			8		2		2		6
Total Split (s)	15.0	15.0		10.0	25.0		10.0	75.0	75.0	65.0	65.0	
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9			5.9
Act Effct Green (s)	7.1	7.1		15.1	13.5		76.9	75.0	75.0			73.0
Actuated g/C Ratio	0.07	0.07		0.15	0.14		0.77	0.75	0.75			0.73
v/c Ratio	0.05	0.27		0.88	0.38		0.04	0.23	0.04			0.55
Control Delay	43.2	37.8		83.7	33.2		4.0	4.2	0.4			13.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0			0.1
Total Delay	43.2	37.8		83.7	33.2		4.0	4.2	0.4			13.8
LOS	D	D		F	C		A	A	A			B
Approach Delay			38.5		65.3			3.9				13.8
Approach LOS			D		E			A				B

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 68 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 17.3

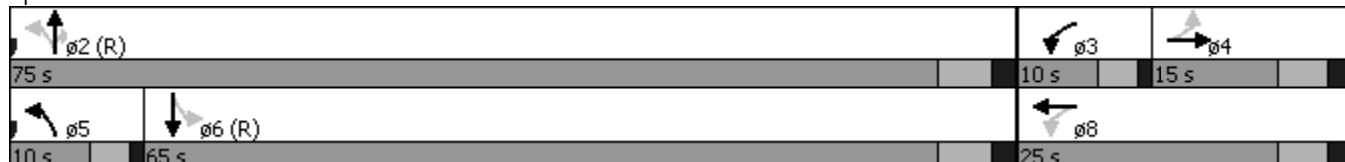
Intersection LOS: B

Intersection Capacity Utilization 79.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	30	5	55	5	5	5	25	145	5	5	465	135
Future Vol, veh/h	30	5	55	5	5	5	25	145	5	5	465	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	650
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	5	60	5	5	5	27	158	5	5	505	147

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	736	733	505	764	731	160	505	0	0	163	0	0
Stage 1	516	516	-	215	215	-	-	-	-	-	-	-
Stage 2	220	217	-	549	516	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	335	348	567	321	349	885	1060	-	-	1416	-	-
Stage 1	542	534	-	787	725	-	-	-	-	-	-	-
Stage 2	782	723	-	520	534	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	321	337	567	277	338	885	1060	-	-	1416	-	-
Mov Cap-2 Maneuver	321	337	-	277	338	-	-	-	-	-	-	-
Stage 1	528	531	-	767	707	-	-	-	-	-	-	-
Stage 2	752	705	-	458	531	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.6	14.6	1.2	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1060	-	-	438	390	1416	-	-
HCM Lane V/C Ratio	0.026	-	-	0.223	0.042	0.004	-	-
HCM Control Delay (s)	8.5	-	-	15.6	14.6	7.6	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0.1	0	-	-

## Timings

10: Main St &amp; Boston Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	5	10	15	20	10	50	40	1190	20	30	985	10
Future Volume (vph)	5	10	15	20	10	50	40	1190	20	30	985	10
Satd. Flow (prot)	1770	1697	0	1770	1630	0	1770	3529	0	1770	3532	0
Flt Permitted	0.715			0.740			0.256			0.196		
Satd. Flow (perm)	1332	1697	0	1378	1630	0	477	3529	0	365	3532	0
Satd. Flow (RTOR)			16			54			4			2
Lane Group Flow (vph)	5	27	0	22	65	0	43	1315	0	33	1082	0
Turn Type	Perm	NA										
Protected Phases			4			8			2			6
Permitted Phases	4			8			2			6		
Total Split (s)	25.0	25.0		25.0	25.0		75.0	75.0		75.0	75.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Act Effct Green (s)	7.3	7.3		7.3	7.3		85.8	85.8		85.8	85.8	
Actuated g/C Ratio	0.07	0.07		0.07	0.07		0.86	0.86		0.86	0.86	
v/c Ratio	0.05	0.20		0.22	0.39		0.11	0.43		0.11	0.36	
Control Delay	43.0	28.6		48.0	22.4		2.5	2.7		0.9	0.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	43.0	28.6		48.0	22.4		2.5	2.7		0.9	0.6	
LOS	D	C		D	C		A	A		A	A	
Approach Delay		30.9			28.8			2.7			0.6	
Approach LOS		C			C			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 25 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.43

Intersection Signal Delay: 3.0

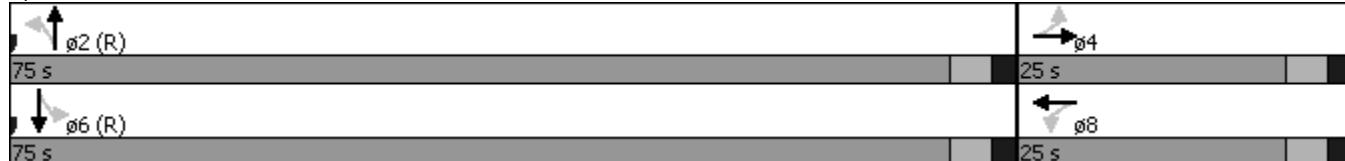
Intersection LOS: A

Intersection Capacity Utilization 49.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 10: Main St &amp; Boston Ave



## Timings

113: Main St &amp; 3rd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	90	350	55	155	405	105	65	1010	130	105	745	70
Future Volume (vph)	90	350	55	155	405	105	65	1010	130	105	745	70
Satd. Flow (prot)	1770	3468	0	1770	3429	0	1770	3479	0	1770	3493	0
Flt Permitted	0.445			0.266			0.244			0.099		
Satd. Flow (perm)	829	3468	0	495	3429	0	455	3479	0	184	3493	0
Satd. Flow (RTOR)		16			36			18			12	
Lane Group Flow (vph)	98	440	0	168	554	0	71	1239	0	114	886	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4			8			2			6	
Total Split (s)	27.0	27.0		14.0	41.0		10.0	49.0		10.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9		4.0	5.2		4.0	5.2	
Act Effct Green (s)	18.0	18.0		33.6	31.7		53.8	46.3		55.7	48.9	
Actuated g/C Ratio	0.18	0.18		0.34	0.32		0.54	0.46		0.56	0.49	
v/c Ratio	0.66	0.69		0.58	0.50		0.22	0.76		0.54	0.52	
Control Delay	59.0	42.7		32.2	27.0		23.6	42.5		22.0	19.8	
Queue Delay	0.0	0.0		0.0	0.4		0.0	0.0		0.0	0.0	
Total Delay	59.0	42.7		32.2	27.5		23.6	42.5		22.0	19.8	
LOS	E	D		C	C		C	D		C	B	
Approach Delay		45.6			28.6			41.5			20.1	
Approach LOS		D			C			D			C	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 21 (21%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 33.5

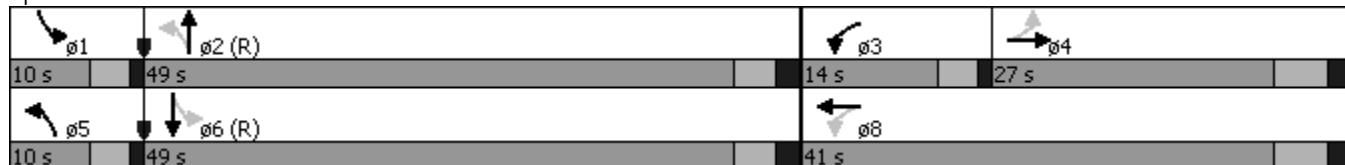
Intersection LOS: C

Intersection Capacity Utilization 74.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Ave



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	295	100	65	55	35	60	1025	90	55	810	45
Future Volume (vph)	140	295	100	65	55	35	60	1025	90	55	810	45
Satd. Flow (prot)	1770	1863	1583	1770	1755	0	1770	3497	0	1770	3511	0
Flt Permitted	0.694			0.256			0.279			0.190		
Satd. Flow (perm)	1293	1863	1583	477	1755	0	520	3497	0	354	3511	0
Satd. Flow (RTOR)				98		30			18			11
Lane Group Flow (vph)	152	321	109	71	98	0	65	1212	0	60	929	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	30.0	30.0	30.0	30.0	30.0		70.0	70.0		70.0	70.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	21.6	21.6	21.6	21.6	21.6		67.3	67.3		67.3	67.3	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22		0.67	0.67		0.67	0.67	
v/c Ratio	0.54	0.80	0.26	0.69	0.24		0.19	0.51		0.25	0.39	
Control Delay	41.9	52.0	9.5	69.1	23.3		14.3	18.4		6.4	5.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.6		0.0	0.0	
Total Delay	41.9	52.0	9.5	69.1	23.3		14.3	19.0		6.4	5.4	
LOS	D	D	A	E	C		B	B		A	A	
Approach Delay		41.4			42.5			18.7			5.5	
Approach LOS		D			D			B			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 47 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 20.1

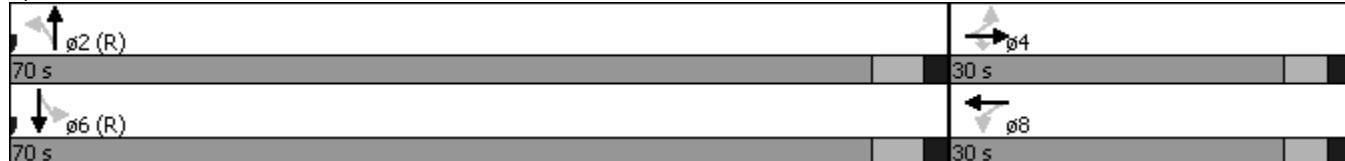
Intersection LOS: C

Intersection Capacity Utilization 74.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↓↓		
Traffic Volume (vph)	15	90	20	65	35	30	20	1115	140	25	985	10
Future Volume (vph)	15	90	20	65	35	30	20	1115	140	25	985	10
Satd. Flow (prot)	1593	1630	0	1593	1559	0	1593	3185	1425	0	3179	0
Flt Permitted	0.711			0.476			0.212				0.894	
Satd. Flow (perm)	1192	1630	0	798	1559	0	355	3185	1425	0	2845	0
Satd. Flow (RTOR)		10			33				152		2	
Lane Group Flow (vph)	16	120	0	71	71	0	22	1212	152	0	1109	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			3	8		5	2		6	
Permitted Phases	4				8			2		2	6	
Total Split (s)	21.0	21.0			9.0	30.0		9.0	70.0	70.0	61.0	61.0
Total Lost Time (s)	5.6	5.6			4.0	5.6		4.0	5.9	5.9	5.9	
Act Effct Green (s)	11.7	11.7			20.5	18.9		71.5	69.6	69.6	66.0	
Actuated g/C Ratio	0.12	0.12			0.20	0.19		0.72	0.70	0.70	0.66	
v/c Ratio	0.11	0.60			0.35	0.22		0.07	0.55	0.15	0.59	
Control Delay	39.5	50.3			35.5	20.5		6.5	9.0	1.4	23.9	
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	39.5	50.3			35.5	20.5		6.5	9.0	1.4	23.9	
LOS	D	D			D	C		A	A	A		C
Approach Delay		49.1				28.0			8.1		23.9	
Approach LOS		D				C		A			C	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 17.5

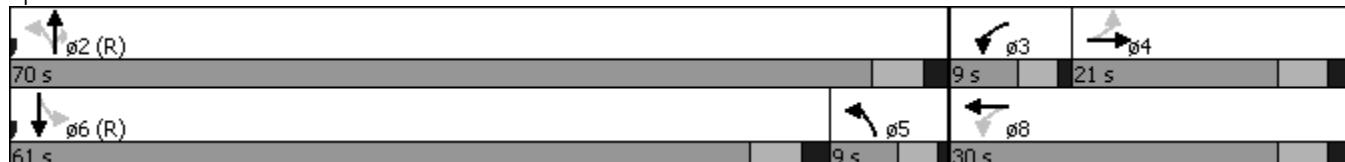
Intersection LOS: B

Intersection Capacity Utilization 70.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 9.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	95	5	75	5	5	5	95	470	5	5	365	70
Future Vol, veh/h	95	5	75	5	5	5	95	470	5	5	365	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	620
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	103	5	82	5	5	5	103	511	5	5	397	76

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1134	1131	397	1171	1128	514	397	0	0	516	0	0
Stage 1	408	408	-	720	720	-	-	-	-	-	-	-
Stage 2	726	723	-	451	408	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	180	203	652	170	204	560	1162	-	-	1050	-	-
Stage 1	620	597	-	419	432	-	-	-	-	-	-	-
Stage 2	416	431	-	588	597	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	162	184	652	135	185	560	1162	-	-	1050	-	-
Mov Cap-2 Maneuver	162	184	-	135	185	-	-	-	-	-	-	-
Stage 1	565	593	-	382	394	-	-	-	-	-	-	-
Stage 2	370	393	-	506	593	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	60.1			24			1.4			0.1		
HCM LOS	F			C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1162	-	-	240	206	1050	-	-
HCM Lane V/C Ratio	0.089	-	-	0.793	0.079	0.005	-	-
HCM Control Delay (s)	8.4	-	-	60.1	24	8.4	0	-
HCM Lane LOS	A	-	-	F	C	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	5.9	0.3	0	-	-

## Timings

6: Main St &amp; Boston Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘		↑ ↗	↑ ↘		↑ ↗	↑ ↘		↑ ↗	↑ ↘	
Traffic Volume (vph)	10	225	40	20	285	10	50	595	30	40	1055	20
Future Volume (vph)	10	225	40	20	285	10	50	595	30	40	1055	20
Satd. Flow (prot)	1770	1822	0	1770	1853	0	1770	3514	0	1770	3529	0
Flt Permitted	0.207			0.270			0.207			0.380		
Satd. Flow (perm)	386	1822	0	503	1853	0	386	3514	0	708	3529	0
Satd. Flow (RTOR)		8			2			12			4	
Lane Group Flow (vph)	11	288	0	22	321	0	54	680	0	43	1169	0
Turn Type	Perm	NA										
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	25.0	25.0		25.0	25.0		75.0	75.0		75.0	75.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Act Effct Green (s)	19.3	19.3		19.3	19.3		70.7	70.7		70.7	70.7	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.71	0.71		0.71	0.71	
v/c Ratio	0.15	0.80		0.23	0.89		0.20	0.27		0.09	0.47	
Control Delay	38.6	55.5		40.4	66.9		7.4	5.6		1.5	2.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	38.6	55.5		40.4	66.9		7.4	5.6		1.5	2.4	
LOS	D	E		D	E		A	A		A	A	
Approach Delay		54.9			65.2			5.8			2.4	
Approach LOS		D			E			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 75 (75%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 17.7

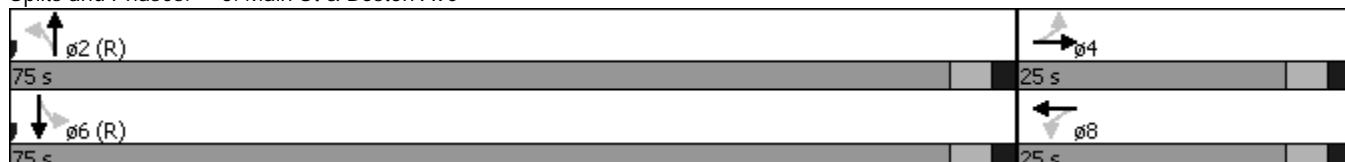
Intersection LOS: B

Intersection Capacity Utilization 62.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: Main St &amp; Boston Ave



## Timings

113: Main St &amp; 3rd Avenue

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑	↑↑	↑	↑↑		↑	↑↑	
Traffic Volume (vph)	20	130	30	200	430	65	45	410	95	90	900	90
Future Volume (vph)	20	130	30	200	430	65	45	410	95	90	900	90
Satd. Flow (prot)	1770	3440	0	1770	3539	1583	1770	3440	0	1770	3490	0
Flt Permitted	0.484			0.455			0.204			0.417		
Satd. Flow (perm)	902	3440	0	848	3539	1583	380	3440	0	777	3490	0
Satd. Flow (RTOR)		26				68			35			13
Lane Group Flow (vph)	22	174	0	217	467	71	49	549	0	98	1076	0
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4				8		8	2			6
Total Split (s)	27.0	27.0		12.0	39.0	39.0	12.0	49.0		12.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9	5.9	4.0	5.2		4.0	5.2	
Act Effct Green (s)	9.7	9.7		23.6	21.7	21.7	64.3	57.8		66.1	58.7	
Actuated g/C Ratio	0.10	0.10		0.24	0.22	0.22	0.64	0.58		0.66	0.59	
v/c Ratio	0.25	0.49		0.79	0.61	0.18	0.15	0.27		0.17	0.52	
Control Delay	48.1	40.5		55.5	38.8	9.5	4.8	9.3		6.4	14.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	48.1	40.5		55.5	38.8	9.5	4.8	9.3		6.4	14.3	
LOS	D	D		E	D	A	A	A		A	B	
Approach Delay		41.4			40.8			8.9			13.6	
Approach LOS		D			D			A			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 25 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 22.1

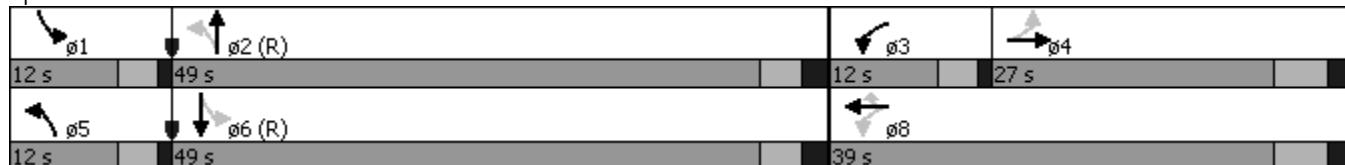
Intersection LOS: C

Intersection Capacity Utilization 64.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Avenue



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBC	WBL	WBT	WBC	NBL	NBT	NBC	SBL	SBT	SBC
Lane Configurations												
Traffic Volume (vph)	80	140	90	145	115	30	40	585	45	30	890	55
Future Volume (vph)	80	140	90	145	115	30	40	585	45	30	890	55
Satd. Flow (prot)	1770	1863	1583	1770	1805	0	1770	3500	0	1770	3507	0
Flt Permitted	0.524			0.542			0.259			0.388		
Satd. Flow (perm)	976	1863	1583	1010	1805	0	482	3500	0	723	3507	0
Satd. Flow (RTOR)				98		11			22			17
Lane Group Flow (vph)	87	152	98	158	158	0	43	685	0	33	1027	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	20.0	20.0	20.0	20.0	20.0		80.0	80.0		80.0	80.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	14.8	14.8	14.8	14.8	14.8		74.1	74.1		74.1	74.1	
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15		0.74	0.74		0.74	0.74	
v/c Ratio	0.60	0.55	0.31	1.06	0.57		0.12	0.26		0.06	0.39	
Control Delay	58.9	48.0	10.8	133.8	45.9		4.4	4.1		2.1	6.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	58.9	48.0	10.8	133.8	45.9		4.4	4.1		2.1	6.1	
LOS	E	D	B	F	D		A	A		A	A	
Approach Delay		40.0			89.8			4.1			6.0	
Approach LOS		D			F			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 45 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 21.0

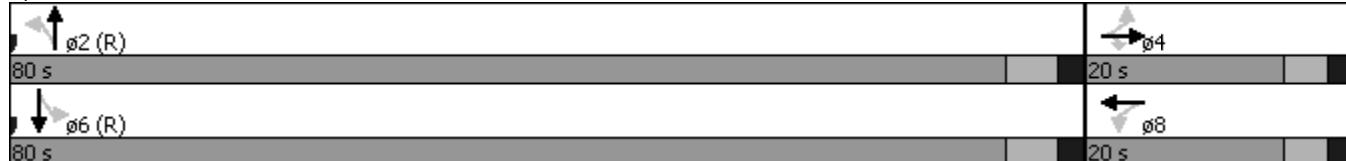
Intersection LOS: C

Intersection Capacity Utilization 62.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↔↔		
Traffic Volume (vph)	10	15	10	80	55	15	10	520	30	25	1100	25
Future Volume (vph)	10	15	10	80	55	15	10	520	30	25	1100	25
Satd. Flow (prot)	1593	1574	0	1593	1623	0	1593	3185	1425	0	3173	0
Flt Permitted	0.889			0.471			0.175				0.933	
Satd. Flow (perm)	1490	1574	0	790	1623	0	293	3185	1425	0	2963	0
Satd. Flow (RTOR)		11			12				72		4	
Lane Group Flow (vph)	11	27	0	87	76	0	11	565	33	0	1250	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			3	8		5	2		6	
Permitted Phases	4				8			2		2	6	
Total Split (s)	15.0	15.0		10.0	25.0		10.0	75.0	75.0	65.0	65.0	
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9		5.9	
Act Effct Green (s)	6.7	6.7		14.6	13.2		79.4	78.7	78.7		76.7	
Actuated g/C Ratio	0.07	0.07		0.15	0.13		0.79	0.79	0.79		0.77	
v/c Ratio	0.11	0.23		0.52	0.34		0.04	0.23	0.03		0.55	
Control Delay	45.3	35.2		47.7	35.4		3.9	3.8	0.1		14.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.1	
Total Delay	45.3	35.2		47.7	35.4		3.9	3.8	0.1		14.2	
LOS	D	D		D	D		A	A	A		B	
Approach Delay		38.1			42.0			3.6			14.2	
Approach LOS		D			D			A			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 68 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 13.7

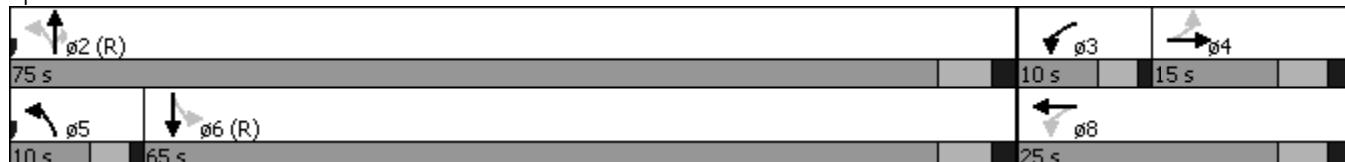
Intersection LOS: B

Intersection Capacity Utilization 75.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	30	5	20	5	5	5	25	155	5	5	500	135
Future Vol, veh/h	30	5	20	5	5	5	25	155	5	5	500	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	650
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	5	22	5	5	5	27	168	5	5	543	147

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	785	782	543	794	780	171	543	0	0	174	0	0
Stage 1	554	554	-	226	226	-	-	-	-	-	-	-
Stage 2	231	228	-	568	554	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	310	326	540	306	327	873	1026	-	-	1403	-	-
Stage 1	517	514	-	777	717	-	-	-	-	-	-	-
Stage 2	772	715	-	508	514	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	297	316	540	283	316	873	1026	-	-	1403	-	-
Mov Cap-2 Maneuver	297	316	-	283	316	-	-	-	-	-	-	-
Stage 1	503	511	-	757	698	-	-	-	-	-	-	-
Stage 2	741	696	-	479	511	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.1	14.8	1.2	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1026	-	-	357	382	1403	-	-
HCM Lane V/C Ratio	0.026	-	-	0.167	0.043	0.004	-	-
HCM Control Delay (s)	8.6	-	-	17.1	14.8	7.6	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.1	0	-	-

## Timings

10: Main St &amp; Boston Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	10	260	30	20	265	50	80	1190	20	30	985	20
Future Volume (vph)	10	260	30	20	265	50	80	1190	20	30	985	20
Satd. Flow (prot)	1770	1833	0	1770	1818	0	1770	3529	0	1770	3529	0
Flt Permitted	0.202			0.222			0.228			0.169		
Satd. Flow (perm)	376	1833	0	414	1818	0	425	3529	0	315	3529	0
Satd. Flow (RTOR)			5			8			4			5
Lane Group Flow (vph)	11	316	0	22	342	0	87	1315	0	33	1093	0
Turn Type	Perm	NA										
Protected Phases			4			8			2			6
Permitted Phases		4			8			2			6	
Total Split (s)	25.0	25.0		25.0	25.0		75.0	75.0		75.0	75.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Act Effct Green (s)	19.8	19.8		19.8	19.8		70.2	70.2		70.2	70.2	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.70	0.70		0.70	0.70	
v/c Ratio	0.15	0.86		0.27	0.93		0.29	0.53		0.15	0.44	
Control Delay	38.7	61.8		43.8	72.8		8.7	8.0		2.3	2.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	38.7	61.8		43.8	72.8		8.7	8.0		2.3	2.3	
LOS	D	E		D	E		A	A		A	A	
Approach Delay		61.1			71.1				8.1		2.3	
Approach LOS		E			E			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 50 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 18.6

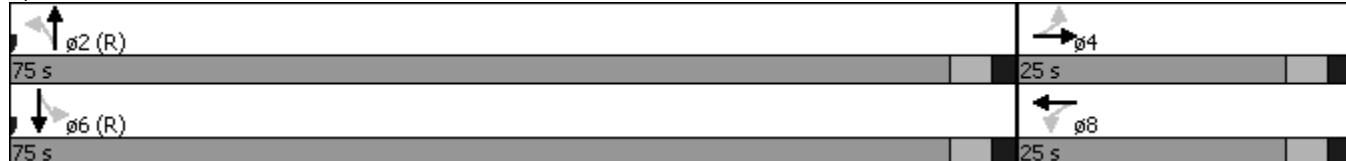
Intersection LOS: B

Intersection Capacity Utilization 66.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 10: Main St &amp; Boston Ave



## Timings

113: Main St &amp; 3rd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	90	280	55	155	325	105	65	1010	130	105	745	70
Future Volume (vph)	90	280	55	155	325	105	65	1010	130	105	745	70
Satd. Flow (prot)	1770	3451	0	1770	3408	0	1770	3479	0	1770	3493	0
Flt Permitted	0.484							0.248			0.106	
Satd. Flow (perm)	902	3451	0	605	3408	0	462	3479	0	197	3493	0
Satd. Flow (RTOR)		21			48			18			12	
Lane Group Flow (vph)	98	364	0	168	467	0	71	1239	0	114	886	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4			8			2			6	
Total Split (s)	27.0	27.0		14.0	41.0		10.0	49.0		10.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9		4.0	5.2		4.0	5.2	
Act Effct Green (s)	16.5	16.5		32.1	30.2		55.3	47.6		57.1	50.2	
Actuated g/C Ratio	0.16	0.16		0.32	0.30		0.55	0.48		0.57	0.50	
v/c Ratio	0.66	0.62		0.55	0.44		0.21	0.74		0.51	0.50	
Control Delay	59.1	40.7		31.5	25.7		14.8	32.4		19.4	19.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	59.1	40.7		31.5	25.7		14.8	32.4		19.4	19.1	
LOS	E	D		C	C		B	C		B	B	
Approach Delay		44.6			27.2			31.5			19.1	
Approach LOS		D			C			C			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 21 (21%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 28.8

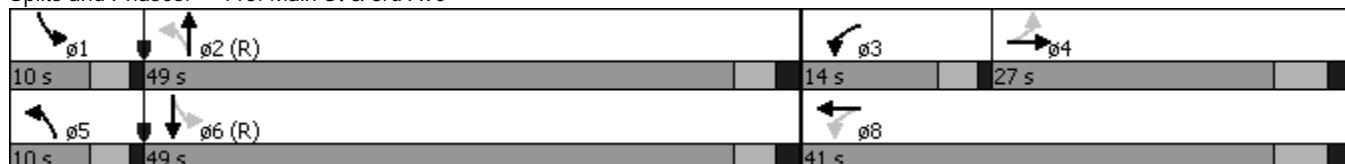
Intersection LOS: C

Intersection Capacity Utilization 72.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Ave



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBC	WBL	WBT	WBC	NBL	NBT	NBC	SBL	SBT	SBC
Lane Configurations												
Traffic Volume (vph)	140	310	100	95	55	45	60	1015	110	60	805	45
Future Volume (vph)	140	310	100	95	55	45	60	1015	110	60	805	45
Satd. Flow (prot)	1770	1863	1583	1770	1738	0	1770	3486	0	1770	3511	0
Flt Permitted	0.687			0.244			0.279			0.185		
Satd. Flow (perm)	1280	1863	1583	455	1738	0	520	3486	0	345	3511	0
Satd. Flow (RTOR)			93		39			23			11	
Lane Group Flow (vph)	152	337	109	103	109	0	65	1223	0	65	924	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Total Split (s)	30.0	30.0	30.0	30.0	30.0		70.0	70.0		70.0	70.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	22.5	22.5	22.5	22.5	22.5		66.4	66.4		66.4	66.4	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22		0.66	0.66		0.66	0.66	
v/c Ratio	0.53	0.81	0.26	1.02	0.26		0.19	0.53		0.28	0.40	
Control Delay	40.7	51.9	10.2	134.2	21.6		4.3	4.5		7.8	6.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.7	51.9	10.2	134.2	21.6		4.3	4.6		7.8	6.0	
LOS	D	D	B	F	C		A	A		A	A	
Approach Delay		41.5			76.3			4.5			6.1	
Approach LOS		D			E			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 47 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 17.1

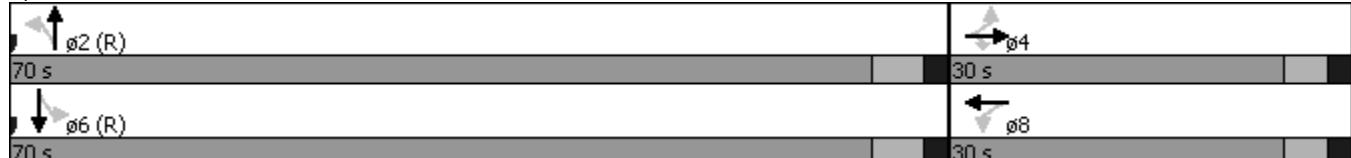
Intersection LOS: B

Intersection Capacity Utilization 76.6%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↓↓		
Traffic Volume (vph)	35	70	20	35	35	20	20	1150	105	15	1015	10
Future Volume (vph)	35	70	20	35	35	20	20	1150	105	15	1015	10
Satd. Flow (prot)	1593	1619	0	1593	1584	0	1593	3185	1425	0	3179	0
Flt Permitted	0.718			0.487			0.214				0.925	
Satd. Flow (perm)	1204	1619	0	816	1584	0	359	3185	1425	0	2943	0
Satd. Flow (RTOR)			12			22			114		2	
Lane Group Flow (vph)	38	98	0	38	60	0	22	1250	114	0	1130	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			3	8		5	2		6	
Permitted Phases		4				8		2		2	6	
Total Split (s)	21.0	21.0		9.0	30.0		9.0	70.0	70.0	61.0	61.0	
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9		5.9	
Act Effct Green (s)	10.7	10.7		17.1	15.9		76.7	76.0	76.0		72.4	
Actuated g/C Ratio	0.11	0.11		0.17	0.16		0.77	0.76	0.76		0.72	
v/c Ratio	0.30	0.54		0.21	0.22		0.07	0.52	0.10		0.53	
Control Delay	45.8	47.0		33.8	24.7		5.7	6.4	1.3		6.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	45.8	47.0		33.8	24.7		5.7	6.4	1.3		6.5	
LOS	D	D		C	C		A	A	A		A	
Approach Delay		46.7			28.2			6.0			6.5	
Approach LOS		D			C			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 39 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 9.0

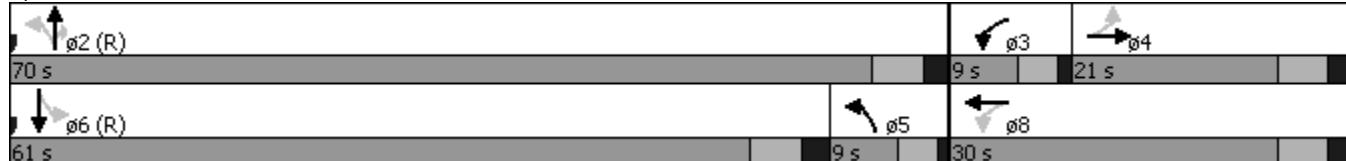
Intersection LOS: A

Intersection Capacity Utilization 61.7%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	95	5	35	5	5	5	15	550	5	5	405	70
Future Vol, veh/h	95	5	35	5	5	5	15	550	5	5	405	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	620
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	103	5	38	5	5	5	16	598	5	5	440	76

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1090	1087	440	1106	1084	601	440	0	0	603	0	0
Stage 1	451	451	-	633	633	-	-	-	-	-	-	-
Stage 2	639	636	-	473	451	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	193	216	617	188	217	500	1120	-	-	975	-	-
Stage 1	588	571	-	468	473	-	-	-	-	-	-	-
Stage 2	464	472	-	572	571	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	184	211	617	170	212	500	1120	-	-	975	-	-
Mov Cap-2 Maneuver	184	211	-	170	212	-	-	-	-	-	-	-
Stage 1	580	567	-	461	466	-	-	-	-	-	-	-
Stage 2	447	465	-	528	567	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	46.3	21.2	0.2	0.1
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1120	-	-	226	238	975	-	-
HCM Lane V/C Ratio	0.015	-	-	0.649	0.069	0.006	-	-
HCM Control Delay (s)	8.3	-	-	46.3	21.2	8.7	0	-
HCM Lane LOS	A	-	-	E	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	4	0.2	0	-	-

## Timings

6: Main St &amp; Boston Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	10	15	25	25	15	15	30	620	35	45	1100	15
Future Volume (vph)	10	15	25	25	15	15	30	620	35	45	1100	15
Satd. Flow (prot)	1770	1688	0	1770	1723	0	1770	3511	0	1770	3532	0
Flt Permitted	0.769			0.769			0.223			0.381		
Satd. Flow (perm)	1432	1688	0	1432	1723	0	415	3511	0	710	3532	0
Satd. Flow (RTOR)		27			16			14			3	
Lane Group Flow (vph)	11	43	0	27	32	0	33	712	0	49	1212	0
Turn Type	Perm	NA										
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	25.0	25.0		25.0	25.0		75.0	75.0		75.0	75.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Act Effct Green (s)	7.4	7.4		7.6	7.6		88.8	88.8		88.8	88.8	
Actuated g/C Ratio	0.07	0.07		0.08	0.08		0.89	0.89		0.89	0.89	
v/c Ratio	0.10	0.29		0.25	0.22		0.09	0.23		0.08	0.39	
Control Delay	44.0	27.4		48.4	30.5		2.5	1.7		0.8	0.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	44.0	27.4		48.4	30.5		2.5	1.7		0.8	0.7	
LOS	D	C		D	C		A	A		A	A	
Approach Delay		30.8			38.7			1.8			0.7	
Approach LOS		C			D			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 79 (79%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 2.9

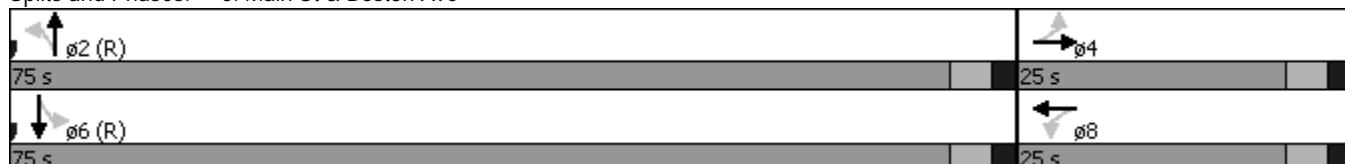
Intersection LOS: A

Intersection Capacity Utilization 53.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 6: Main St &amp; Boston Ave



## Timings

113: Main St &amp; 3rd Avenue

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	175	30	210	575	70	55	510	120	110	1120	110
Future Volume (vph)	20	175	30	210	575	70	55	510	120	110	1120	110
Satd. Flow (prot)	1770	3461	0	1770	3539	1583	1770	3437	0	1770	3493	0
Flt Permitted	0.415				0.459			0.120			0.325	
Satd. Flow (perm)	773	3461	0	855	3539	1583	224	3437	0	605	3493	0
Satd. Flow (RTOR)		18				68		36			13	
Lane Group Flow (vph)	22	223	0	228	625	76	60	684	0	120	1337	0
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4			8		8	2			6	
Total Split (s)	27.0	27.0		12.0	39.0	39.0	12.0	49.0		12.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9	5.9	4.0	5.2		4.0	5.2	
Act Effct Green (s)	12.7	12.7		26.6	24.7	24.7	60.0	52.0		63.4	55.3	
Actuated g/C Ratio	0.13	0.13		0.27	0.25	0.25	0.60	0.52		0.63	0.55	
v/c Ratio	0.22	0.49		0.76	0.71	0.17	0.25	0.38		0.25	0.69	
Control Delay	42.7	40.1		47.9	39.0	9.0	10.8	15.8		8.6	20.0	
Queue Delay	0.0	0.0		0.0	0.2	0.0	0.0	0.0		0.0	0.0	
Total Delay	42.7	40.1		47.9	39.2	9.0	10.8	15.8		8.6	20.0	
LOS	D	D		D	D	A	B	B		A	C	
Approach Delay		40.3			38.8			15.4			19.1	
Approach LOS		D			D			B			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 25 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 25.3

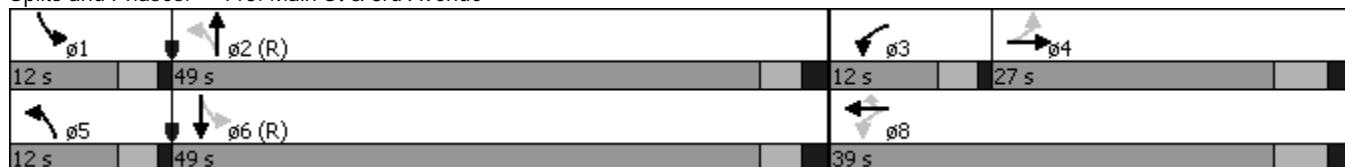
Intersection LOS: C

Intersection Capacity Utilization 75.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Avenue



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘	↗ ↙	↑ ↗	↑ ↘	↗ ↙	↑ ↗	↑ ↘	↗ ↙	↑ ↗	↑ ↘	↗ ↙
Traffic Volume (vph)	90	160	100	95	130	25	50	740	50	30	1115	70
Future Volume (vph)	90	160	100	95	130	25	50	740	50	30	1115	70
Satd. Flow (prot)	1770	1863	1583	1770	1818	0	1770	3507	0	1770	3507	0
Flt Permitted	0.479			0.460			0.188			0.319		
Satd. Flow (perm)	892	1863	1583	857	1818	0	350	3507	0	594	3507	0
Satd. Flow (RTOR)				109		8		19			18	
Lane Group Flow (vph)	98	174	109	103	168	0	54	858	0	33	1288	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	20.0	20.0	20.0	20.0	20.0		80.0	80.0		80.0	80.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	13.9	13.9	13.9	13.9	13.9		75.0	75.0		75.0	75.0	
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14		0.75	0.75		0.75	0.75	
v/c Ratio	0.79	0.67	0.35	0.87	0.65		0.21	0.33		0.07	0.49	
Control Delay	82.4	54.3	10.9	97.5	51.0		5.9	4.2		1.2	4.6	
Queue Delay	0.0	0.0	0.1	0.0	0.0		0.0	0.0		0.0	0.1	
Total Delay	82.4	54.3	10.9	97.5	51.0		5.9	4.2		1.2	4.7	
LOS	F	D	B	F	D		A	A		A	A	
Approach Delay		49.1			68.7			4.3			4.6	
Approach LOS		D			E			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 45 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 16.4

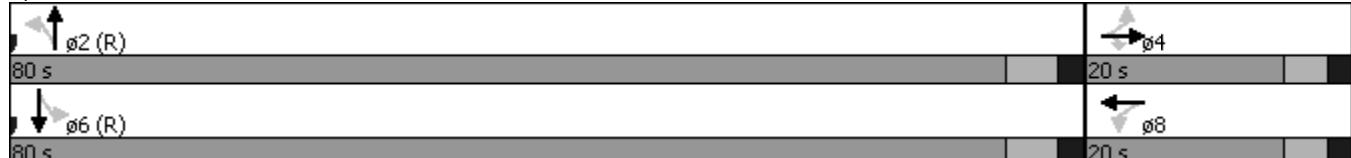
Intersection LOS: B

Intersection Capacity Utilization 68.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑	↑	↔↔		
Traffic Volume (vph)	5	20	10	145	55	25	10	635	50	35	1295	30
Future Volume (vph)	5	20	10	145	55	25	10	635	50	35	1295	30
Satd. Flow (prot)	1593	1593	0	1593	1598	0	1593	3185	1425	0	3173	0
Flt Permitted	0.833			0.455			0.122				0.917	
Satd. Flow (perm)	1397	1593	0	763	1598	0	205	3185	1425	0	2912	0
Satd. Flow (RTOR)			11			21			72			4
Lane Group Flow (vph)	5	33	0	158	87	0	11	690	54	0	1479	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases			4		3	8		5	2			6
Permitted Phases			4			8		2		2		6
Total Split (s)	21.0	21.0		9.0	30.0		9.0	70.0	70.0	61.0		61.0
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9			5.9
Act Effct Green (s)	7.1	7.1		14.5	12.9		77.5	75.6	75.6			73.6
Actuated g/C Ratio	0.07	0.07		0.14	0.13		0.78	0.76	0.76			0.74
v/c Ratio	0.05	0.27		0.98	0.39		0.05	0.29	0.05			0.69
Control Delay	43.2	37.7		106.3	33.9		4.0	4.5	0.7			12.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0			0.0
Total Delay	43.2	37.7		106.3	33.9		4.0	4.5	0.7			12.1
LOS	D	D		F	C		A	A	A			B
Approach Delay			38.5		80.6			4.2				12.1
Approach LOS			D		F			A				B

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 68 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 16.8

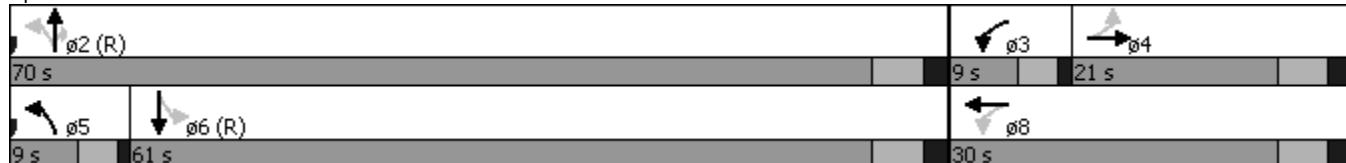
Intersection LOS: B

Intersection Capacity Utilization 91.6%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	30	5	55	5	5	5	25	150	5	5	485	140
Future Vol, veh/h	30	5	55	5	5	5	25	150	5	5	485	140
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	650
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	5	60	5	5	5	27	163	5	5	527	152

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	764	761	527	791	758	166	527	0	0	168	0	0
Stage 1	538	538	-	220	220	-	-	-	-	-	-	-
Stage 2	226	223	-	571	538	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	321	335	551	307	336	878	1040	-	-	1410	-	-
Stage 1	527	522	-	782	721	-	-	-	-	-	-	-
Stage 2	777	719	-	506	522	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	307	324	551	264	325	878	1040	-	-	1410	-	-
Mov Cap-2 Maneuver	307	324	-	264	325	-	-	-	-	-	-	-
Stage 1	513	519	-	762	702	-	-	-	-	-	-	-
Stage 2	746	700	-	444	519	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	15	1.2	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1040	-	-	423	375	1410	-	-
HCM Lane V/C Ratio	0.026	-	-	0.231	0.043	0.004	-	-
HCM Control Delay (s)	8.6	-	-	16.1	15	7.6	0	-
HCM Lane LOS	A	-	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	0.1	0	-	-

## Timings

10: Main St &amp; Boston Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	10	15	20	25	15	55	45	1240	25	35	1025	15
Future Volume (vph)	10	15	20	25	15	55	45	1240	25	35	1025	15
Satd. Flow (prot)	1770	1701	0	1770	1643	0	1770	3529	0	1770	3532	0
Flt Permitted	0.708			0.732			0.242			0.182		
Satd. Flow (perm)	1319	1701	0	1364	1643	0	451	3529	0	339	3532	0
Satd. Flow (RTOR)		22			60			4			3	
Lane Group Flow (vph)	11	38	0	27	76	0	49	1375	0	38	1130	0
Turn Type	Perm	NA										
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	30.0	30.0		30.0	30.0		70.0	70.0		70.0	70.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Act Effct Green (s)	7.6	7.6		7.6	7.6		85.5	85.5		85.5	85.5	
Actuated g/C Ratio	0.08	0.08		0.08	0.08		0.86	0.86		0.86	0.86	
v/c Ratio	0.11	0.25		0.26	0.42		0.13	0.46		0.13	0.37	
Control Delay	44.1	28.2		48.8	22.9		2.9	3.0		0.7	0.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	44.1	28.2		48.8	22.9		2.9	3.0		0.7	0.4	
LOS	D	C		D	C		A	A		A	A	
Approach Delay		31.7			29.7			3.0			0.4	
Approach LOS		C			C			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 46 (46%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 3.4

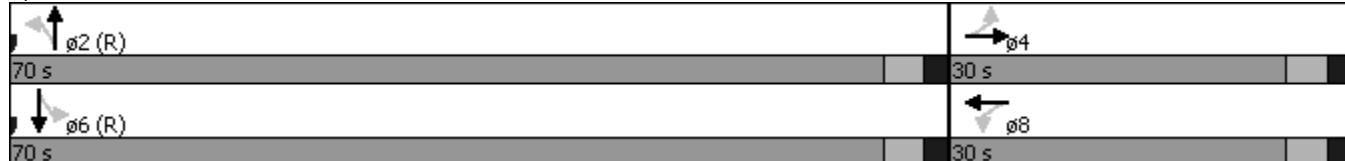
Intersection LOS: A

Intersection Capacity Utilization 53.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 10: Main St &amp; Boston Ave



## Timings

113: Main St &amp; 3rd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	95	375	60	165	430	110	80	1255	160	130	925	85
Future Volume (vph)	95	375	60	165	430	110	80	1255	160	130	925	85
Satd. Flow (prot)	1770	3465	0	1770	3429	0	1770	3479	0	1770	3493	0
Flt Permitted	0.431			0.242			0.159			0.084		
Satd. Flow (perm)	803	3465	0	451	3429	0	296	3479	0	156	3493	0
Satd. Flow (RTOR)		16			35			18			12	
Lane Group Flow (vph)	103	473	0	179	587	0	87	1538	0	141	1097	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4				8			2			6
Total Split (s)	27.0	27.0		14.0	41.0		10.0	49.0		10.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9		4.0	5.2		4.0	5.2	
Act Effct Green (s)	18.5	18.5		34.1	32.2		53.1	45.4		55.1	48.2	
Actuated g/C Ratio	0.18	0.18		0.34	0.32		0.53	0.45		0.55	0.48	
v/c Ratio	0.70	0.72		0.63	0.52		0.35	0.97		0.70	0.65	
Control Delay	62.4	43.6		34.4	27.2		19.0	52.6		36.4	22.8	
Queue Delay	0.0	0.0		0.0	0.6		0.0	0.0		0.0	0.0	
Total Delay	62.4	43.6		34.4	27.8		19.0	52.6		36.4	22.8	
LOS	E	D		C	C		B	D		D	C	
Approach Delay		47.0			29.4			50.8			24.4	
Approach LOS		D			C			D			C	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 21 (21%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 38.6

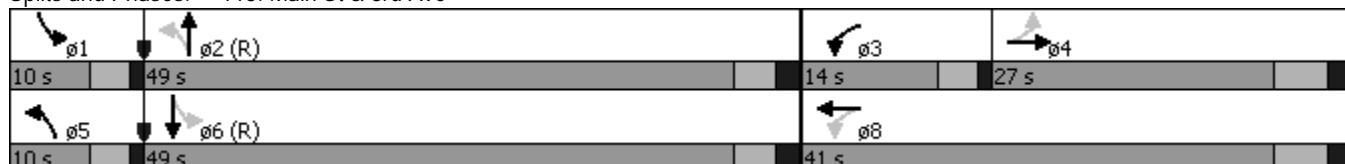
Intersection LOS: D

Intersection Capacity Utilization 85.2%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Ave



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	335	115	75	60	40	75	1275	110	70	1010	55
Future Volume (vph)	160	335	115	75	60	40	75	1275	110	70	1010	55
Satd. Flow (prot)	1770	1863	1583	1770	1751	0	1770	3497	0	1770	3511	0
Flt Permitted	0.687			0.205			0.202			0.118		
Satd. Flow (perm)	1280	1863	1583	382	1751	0	376	3497	0	220	3511	0
Satd. Flow (RTOR)				99		32		18				11
Lane Group Flow (vph)	174	364	125	82	108	0	82	1506	0	76	1158	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	30.0	30.0	30.0	30.0	30.0		70.0	70.0		70.0	70.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	23.0	23.0	23.0	23.0	23.0		65.9	65.9		65.9	65.9	
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23		0.66	0.66		0.66	0.66	
v/c Ratio	0.59	0.85	0.28	0.94	0.25		0.33	0.65		0.52	0.50	
Control Delay	42.9	56.0	11.2	122.5	23.1		5.9	4.3		20.4	6.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.1		0.0	0.0	
Total Delay	42.9	56.0	11.2	122.5	23.1		5.9	4.4		20.4	6.4	
LOS	D	E	B	F	C		A	A		C	A	
Approach Delay		44.1			66.0			4.5			7.3	
Approach LOS		D			E			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 47 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 15.8

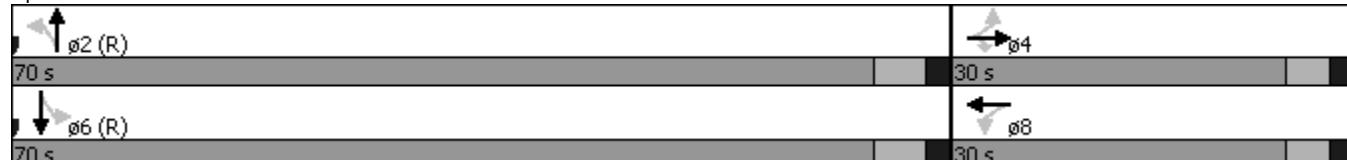
Intersection LOS: B

Intersection Capacity Utilization 84.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↗ ↘		↑ ↗	↗ ↘		↑ ↗	↑ ↗	↗ ↘		↖ ↗ ↘	
Traffic Volume (vph)	15	95	20	70	35	30	25	1390	175	30	1225	10
Future Volume (vph)	15	95	20	70	35	30	25	1390	175	30	1225	10
Satd. Flow (prot)	1593	1633	0	1593	1559	0	1593	3185	1425	0	3179	0
Flt Permitted	0.711				0.467			0.138				0.862
Satd. Flow (perm)	1192	1633	0	783	1559	0	231	3185	1425	0	2743	0
Satd. Flow (RTOR)		9				33			190		1	
Lane Group Flow (vph)	16	125	0	76	71	0	27	1511	190	0	1376	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			3	8		5	2		6	
Permitted Phases	4				8			2		2	6	
Total Split (s)	21.0	21.0			9.0	30.0		9.0	70.0	70.0	61.0	61.0
Total Lost Time (s)	5.6	5.6			4.0	5.6		4.0	5.9	5.9	5.9	
Act Effct Green (s)	12.0	12.0			20.8	19.2		71.2	69.3	69.3	63.9	
Actuated g/C Ratio	0.12	0.12			0.21	0.19		0.71	0.69	0.69	0.64	
v/c Ratio	0.11	0.62			0.37	0.22		0.12	0.68	0.18	0.78	
Control Delay	39.3	51.4			36.2	20.4		6.8	10.2	1.1	13.6	
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	39.3	51.4			36.2	20.4		6.8	10.2	1.1	13.6	
LOS	D	D			D	C		A	B	A		B
Approach Delay		50.1				28.6			9.2		13.6	
Approach LOS		D				C			A		B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 39 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 13.5

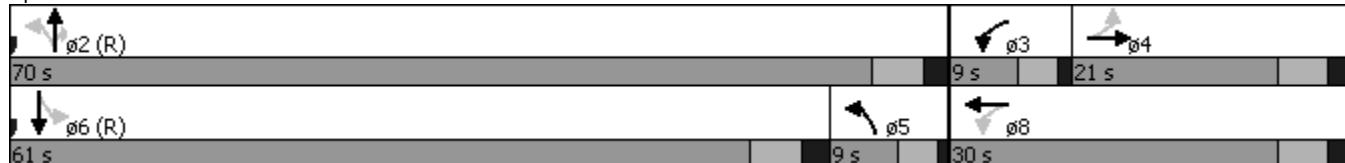
Intersection LOS: B

Intersection Capacity Utilization 82.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 13.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	100	5	80	5	5	5	100	490	5	5	380	75
Future Vol, veh/h	100	5	80	5	5	5	100	490	5	5	380	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	620
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	109	5	87	5	5	5	109	533	5	5	413	82

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1182	1179	413	1223	1177	535	413	0	0	538	0	0
Stage 1	424	424	-	753	753	-	-	-	-	-	-	-
Stage 2	758	755	-	470	424	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	167	190	639	156	191	545	1146	-	-	1030	-	-
Stage 1	608	587	-	402	417	-	-	-	-	-	-	-
Stage 2	399	417	-	574	587	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	149	171	639	121	172	545	1146	-	-	1030	-	-
Mov Cap-2 Maneuver	149	171	-	121	172	-	-	-	-	-	-	-
Stage 1	550	583	-	364	377	-	-	-	-	-	-	-
Stage 2	352	377	-	488	583	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	81.9			25.8			1.4			0.1		
HCM LOS	F			D								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1146	-	-	224	189	1030	-	-
HCM Lane V/C Ratio	0.095	-	-	0.898	0.086	0.005	-	-
HCM Control Delay (s)	8.5	-	-	81.9	25.8	8.5	0	-
HCM Lane LOS	A	-	-	F	D	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	7.4	0.3	0	-	-

## Timings

6: Main St &amp; Boston Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	15	235	45	25	295	15	55	620	35	45	1100	25
Future Volume (vph)	15	235	45	25	295	15	55	620	35	45	1100	25
Satd. Flow (prot)	1770	1818	0	1770	1850	0	1770	3511	0	1770	3529	0
Flt Permitted	0.203			0.245			0.192			0.366		
Satd. Flow (perm)	378	1818	0	456	1850	0	358	3511	0	682	3529	0
Satd. Flow (RTOR)		9			2			14			5	
Lane Group Flow (vph)	16	304	0	27	337	0	60	712	0	49	1223	0
Turn Type	Perm	NA										
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	25.0	25.0		25.0	25.0		75.0	75.0		75.0	75.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Act Effct Green (s)	19.7	19.7		19.7	19.7		70.3	70.3		70.3	70.3	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.70	0.70		0.70	0.70	
v/c Ratio	0.22	0.84		0.30	0.92		0.24	0.29		0.10	0.49	
Control Delay	41.9	58.2		44.4	71.7		8.3	5.8		2.2	3.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.9	58.2		44.4	71.7		8.3	5.8		2.2	3.0	
LOS	D	E		D	E		A	A		A	A	
Approach Delay		57.4			69.7			6.0			3.0	
Approach LOS		E			E			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 75 (75%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 19.1

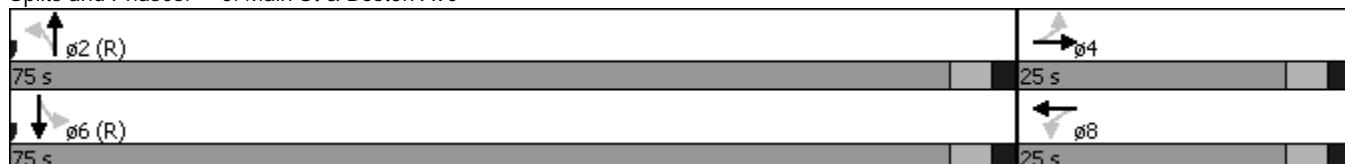
Intersection LOS: B

Intersection Capacity Utilization 67.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 6: Main St &amp; Boston Ave



## Timings

113: Main St &amp; 3rd Avenue

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑	↑	↑	↑↑		↑	↑↑	
Traffic Volume (vph)	20	140	30	210	455	70	55	510	120	110	1120	110
Future Volume (vph)	20	140	30	210	455	70	55	510	120	110	1120	110
Satd. Flow (prot)	1770	3444	0	1770	3539	1583	1770	3437	0	1770	3493	0
Flt Permitted	0.471				0.455			0.130			0.334	
Satd. Flow (perm)	877	3444	0	848	3539	1583	242	3437	0	622	3493	0
Satd. Flow (RTOR)		24				68		36			13	
Lane Group Flow (vph)	22	185	0	228	495	76	60	684	0	120	1337	0
Turn Type	Perm	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4				8		8	2			6
Total Split (s)	27.0	27.0		12.0	39.0	39.0	12.0	49.0		12.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9	5.9	4.0	5.2		4.0	5.2	
Act Effct Green (s)	10.1	10.1		24.0	22.1	22.1	62.7	54.8		65.9	58.0	
Actuated g/C Ratio	0.10	0.10		0.24	0.22	0.22	0.63	0.55		0.66	0.58	
v/c Ratio	0.25	0.50		0.82	0.63	0.19	0.24	0.36		0.24	0.66	
Control Delay	47.2	41.1		58.1	38.9	10.2	8.1	12.5		7.2	17.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	47.2	41.1		58.1	38.9	10.2	8.1	12.5		7.2	17.3	
LOS	D	D		E	D	B	A	B		A	B	
Approach Delay		41.8			41.7			12.1			16.4	
Approach LOS		D			D			B			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 25 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 23.4

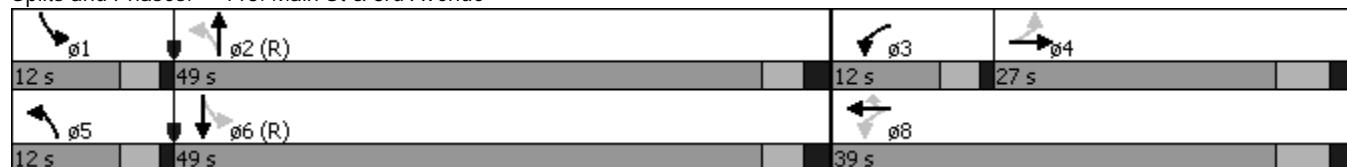
Intersection LOS: C

Intersection Capacity Utilization 72.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Avenue



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	90	160	100	165	130	35	50	730	55	35	1110	70
Future Volume (vph)	90	160	100	165	130	35	50	730	55	35	1110	70
Satd. Flow (prot)	1770	1863	1583	1770	1803	0	1770	3500	0	1770	3507	0
Flt Permitted	0.461			0.476			0.188			0.319		
Satd. Flow (perm)	859	1863	1583	887	1803	0	350	3500	0	594	3507	0
Satd. Flow (RTOR)				109		11			21			18
Lane Group Flow (vph)	98	174	109	179	179	0	54	853	0	38	1283	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	20.0	20.0	20.0	20.0	20.0		80.0	80.0		80.0	80.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	14.8	14.8	14.8	14.8	14.8		74.1	74.1		74.1	74.1	
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15		0.74	0.74		0.74	0.74	
v/c Ratio	0.77	0.63	0.33	1.37	0.65		0.21	0.33		0.09	0.49	
Control Delay	78.9	51.3	10.6	241.1	49.6		5.8	4.3		1.7	6.4	
Queue Delay	0.0	0.0	0.1	0.0	0.0		0.0	0.0		0.0	0.1	
Total Delay	78.9	51.3	10.7	241.1	49.6		5.8	4.3		1.7	6.5	
LOS	E	D	B	F	D		A	A		A	A	
Approach Delay		46.8			145.4			4.4			6.3	
Approach LOS		D			F			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 45 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.37

Intersection Signal Delay: 27.7

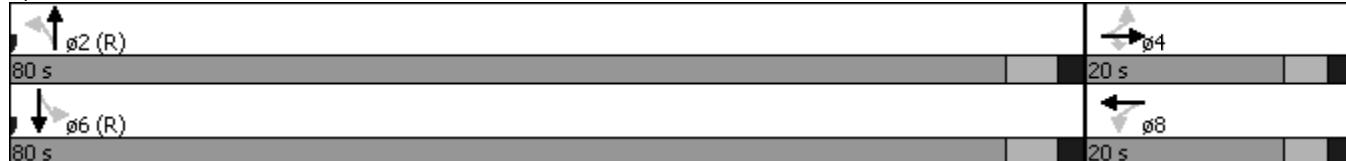
Intersection LOS: C

Intersection Capacity Utilization 72.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↑ ↗	↗ ↘	10	10	85	55	15	10	645	35	30	1370	30
Traffic Volume (vph)	10	15	10	85	55	15	10	645	35	30	1370	30	
Future Volume (vph)	10	15	10	85	55	15	10	645	35	30	1370	30	
Satd. Flow (prot)	1593	1574	0	1593	1623	0	1593	3185	1425	0	3173	0	
Flt Permitted	0.889			0.471				0.113				0.925	
Satd. Flow (perm)	1490	1574	0	790	1623	0	189	3185	1425	0	2938	0	
Satd. Flow (RTOR)		11			13				72		3		
Lane Group Flow (vph)	11	27	0	92	76	0	11	701	38	0	1555	0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA		
Protected Phases		4			3	8		5	2		6		
Permitted Phases	4				8			2		2	6		
Total Split (s)	21.0	21.0		9.0	30.0		9.0	70.0	70.0	61.0	61.0		
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9		5.9		
Act Effct Green (s)	6.7	6.7		13.7	12.6		80.1	79.3	79.3		77.3		
Actuated g/C Ratio	0.07	0.07		0.14	0.13		0.80	0.79	0.79		0.77		
v/c Ratio	0.11	0.23		0.59	0.35		0.05	0.28	0.03		0.68		
Control Delay	45.3	35.2		53.6	36.1		3.9	4.0	0.3		13.3		
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0		
Total Delay	45.3	35.2		53.6	36.1		3.9	4.0	0.3		13.3		
LOS	D	D		D	D		A	A	A		B		
Approach Delay		38.1			45.7			3.8			13.3		
Approach LOS		D			D			A			B		

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 68 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 13.0

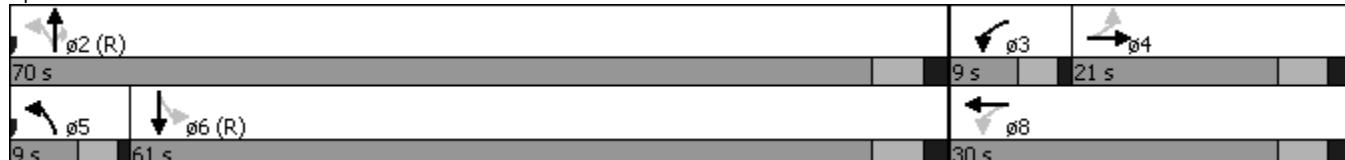
Intersection LOS: B

Intersection Capacity Utilization 88.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	30	5	20	5	5	5	15	160	5	5	520	140
Future Vol, veh/h	30	5	20	5	5	5	15	160	5	5	520	140
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	650
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	5	22	5	5	5	16	174	5	5	565	152

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	791	788	565	799	785	177	565	0	0	179	0	0
Stage 1	576	576	-	209	209	-	-	-	-	-	-	-
Stage 2	215	212	-	590	576	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	307	323	524	304	325	866	1007	-	-	1397	-	-
Stage 1	503	502	-	793	729	-	-	-	-	-	-	-
Stage 2	787	727	-	494	502	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	296	316	524	283	318	866	1007	-	-	1397	-	-
Mov Cap-2 Maneuver	296	316	-	283	318	-	-	-	-	-	-	-
Stage 1	495	499	-	780	717	-	-	-	-	-	-	-
Stage 2	764	715	-	466	499	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	14.8	0.7	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	354	383	1397	-	-
HCM Lane V/C Ratio	0.016	-	-	0.169	0.043	0.004	-	-
HCM Control Delay (s)	8.6	-	-	17.2	14.8	7.6	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.1	0	-	-

## Timings

10: Main St &amp; Boston Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	15	270	35	25	310	55	85	1240	25	35	1025	25
Future Volume (vph)	15	270	35	25	310	55	85	1240	25	35	1025	25
Satd. Flow (prot)	1770	1831	0	1770	1820	0	1770	3529	0	1770	3525	0
Flt Permitted	0.167			0.276			0.204			0.144		
Satd. Flow (perm)	311	1831	0	514	1820	0	380	3529	0	268	3525	0
Satd. Flow (RTOR)		6			9			4			5	
Lane Group Flow (vph)	16	331	0	27	397	0	92	1375	0	38	1141	0
Turn Type	Perm	NA										
Protected Phases		4			8				2			6
Permitted Phases	4			8			2			6		
Total Split (s)	30.0	30.0		30.0	30.0		70.0	70.0		70.0	70.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Act Effct Green (s)	23.9	23.9		23.9	23.9		66.1	66.1		66.1	66.1	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.66	0.66		0.66	0.66	
v/c Ratio	0.22	0.75		0.22	0.90		0.37	0.59		0.21	0.49	
Control Delay	38.4	46.1		35.3	61.0		13.2	10.9		3.1	2.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	38.4	46.1		35.3	61.0		13.2	10.9		3.1	2.1	
LOS	D	D		D	E		B	B		A	A	
Approach Delay		45.8			59.3			11.0			2.1	
Approach LOS		D			E			B			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 45 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 17.5

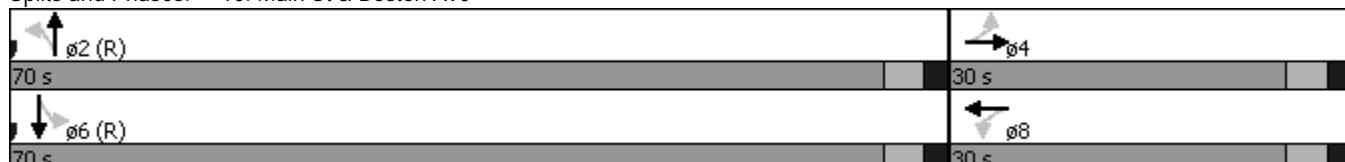
Intersection LOS: B

Intersection Capacity Utilization 71.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 10: Main St &amp; Boston Ave



## Timings

113: Main St &amp; 3rd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	95	295	60	165	345	110	80	1255	160	130	925	85
Future Volume (vph)	95	295	60	165	345	110	80	1255	160	130	925	85
Satd. Flow (prot)	1770	3451	0	1770	3412	0	1770	3479	0	1770	3493	0
Flt Permitted	0.471				0.313			0.168			0.081	
Satd. Flow (perm)	877	3451	0	583	3412	0	313	3479	0	151	3493	0
Satd. Flow (RTOR)		22				47			18			12
Lane Group Flow (vph)	103	386	0	179	495	0	87	1538	0	141	1097	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			3	8		5	2		1	6
Permitted Phases		4				8			2			6
Total Split (s)	28.0	28.0		13.0	41.0		10.0	49.0		10.0	49.0	
Total Lost Time (s)	5.9	5.9		4.0	5.9		4.0	5.2		4.0	5.2	
Act Effct Green (s)	17.4	17.4		32.2	30.3		54.6	46.8		57.4	50.0	
Actuated g/C Ratio	0.17	0.17		0.32	0.30		0.55	0.47		0.57	0.50	
v/c Ratio	0.68	0.63		0.61	0.46		0.33	0.94		0.67	0.63	
Control Delay	60.0	40.1		34.2	26.3		16.2	45.7		33.5	21.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	60.0	40.1		34.2	26.3		16.2	45.7		33.5	21.5	
LOS	E	D		C	C		B	D		C	C	
Approach Delay		44.3			28.4			44.2			22.9	
Approach LOS		D			C			D			C	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 21 (21%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 35.0

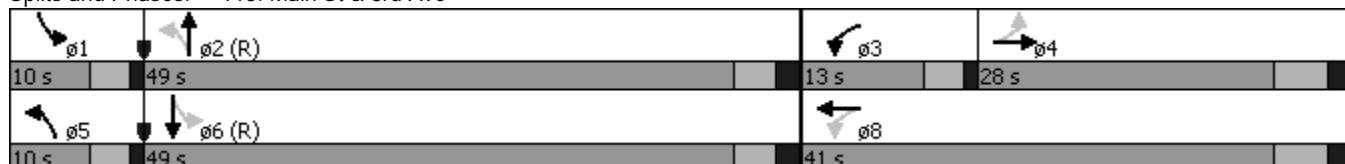
Intersection LOS: C

Intersection Capacity Utilization 82.8%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 113: Main St &amp; 3rd Ave



## Timings

114: Main St &amp; 2nd Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	350	115	105	60	50	75	1265	135	75	1000	55
Future Volume (vph)	160	350	115	105	60	50	75	1265	135	75	1000	55
Satd. Flow (prot)	1770	1863	1583	1770	1736	0	1770	3490	0	1770	3511	0
Flt Permitted	0.677			0.214			0.200			0.109		
Satd. Flow (perm)	1261	1863	1583	399	1736	0	373	3490	0	203	3511	0
Satd. Flow (RTOR)			94		40			23			11	
Lane Group Flow (vph)	174	380	125	114	119	0	82	1522	0	82	1147	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8				2			6
Permitted Phases	4		4	8			2			6		
Total Split (s)	30.0	30.0	30.0	30.0	30.0		70.0	70.0		70.0	70.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2		5.9	5.9		5.9	5.9	
Act Effct Green (s)	24.8	24.8	24.8	24.8	24.8		64.1	64.1		64.1	64.1	
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.64	0.64		0.64	0.64	
v/c Ratio	0.56	0.82	0.27	1.16	0.26		0.34	0.68		0.63	0.51	
Control Delay	40.8	51.8	11.7	178.6	21.8		6.7	5.6		30.9	7.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.1		0.0	0.0	
Total Delay	40.8	51.8	11.7	178.6	21.8		6.7	5.7		30.9	7.6	
LOS	D	D	B	F	C		A	A		C	A	
Approach Delay		41.6			98.5			5.8			9.1	
Approach LOS		D			F			A			A	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 47 (47%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.16

Intersection Signal Delay: 19.1

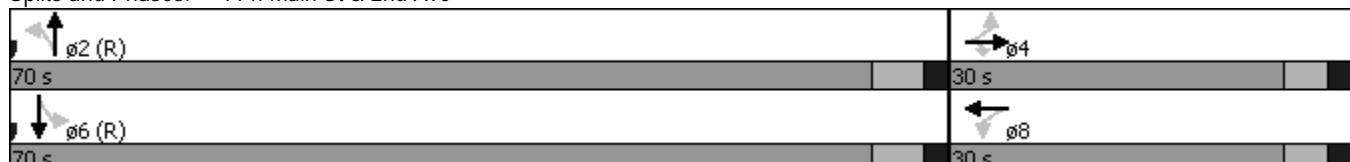
Intersection LOS: B

Intersection Capacity Utilization 87.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 114: Main St &amp; 2nd Ave



## Timings

115: Main St &amp; 1st Ave

7/26/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↗ ↘		↑ ↗	↗ ↘		↑ ↗	↑ ↗	↗ ↘	↙ ↗	↖ ↗	
Traffic Volume (vph)	35	75	20	35	35	20	25	1430	130	20	1265	10
Future Volume (vph)	35	75	20	35	35	20	25	1430	130	20	1265	10
Satd. Flow (prot)	1593	1623	0	1593	1584	0	1593	3185	1425	0	3179	0
Flt Permitted	0.718			0.506			0.136				0.901	
Satd. Flow (perm)	1204	1623	0	848	1584	0	228	3185	1425	0	2867	0
Satd. Flow (RTOR)		11			22				141		1	
Lane Group Flow (vph)	38	104	0	38	60	0	27	1554	141	0	1408	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			3	8		5	2		6	
Permitted Phases	4				8			2		2	6	
Total Split (s)	21.0	21.0		9.0	30.0		9.0	70.0	70.0	61.0	61.0	
Total Lost Time (s)	5.6	5.6		4.0	5.6		4.0	5.9	5.9		5.9	
Act Effct Green (s)	11.0	11.0		18.0	16.4		74.0	72.1	72.1		66.7	
Actuated g/C Ratio	0.11	0.11		0.18	0.16		0.74	0.72	0.72		0.67	
v/c Ratio	0.29	0.55		0.20	0.22		0.11	0.68	0.13		0.74	
Control Delay	45.0	48.1		33.2	24.4		6.0	7.6	1.0		10.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	45.0	48.1		33.2	24.4		6.0	7.6	1.0		10.7	
LOS	D	D		C	C		A	A	A		B	
Approach Delay		47.3			27.8			7.1			10.7	
Approach LOS		D			C			A			B	

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 39 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of 1st Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 10.9

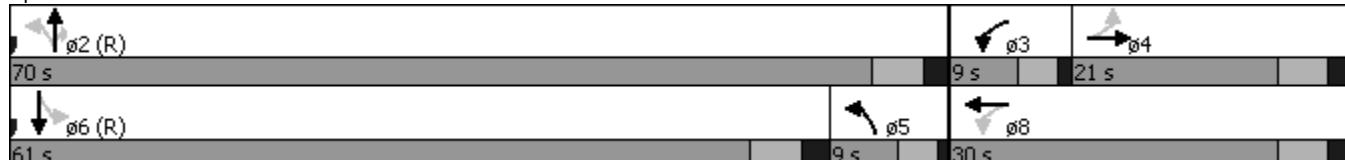
Intersection LOS: B

Intersection Capacity Utilization 73.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 115: Main St &amp; 1st Ave



## Intersection

Int Delay, s/veh 6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	100	5	35	5	5	5	15	570	5	5	420	75
Future Vol, veh/h	100	5	35	5	5	5	15	570	5	5	420	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	225	-	-	-	-	620
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	109	5	38	5	5	5	16	620	5	5	457	82

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1127	1125	457	1144	1122	622	457	0	0	625	0	0
Stage 1	467	467	-	655	655	-	-	-	-	-	-	-
Stage 2	660	658	-	489	467	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	182	205	604	177	206	487	1104	-	-	956	-	-
Stage 1	576	562	-	455	463	-	-	-	-	-	-	-
Stage 2	452	461	-	561	562	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	173	200	604	160	201	487	1104	-	-	956	-	-
Mov Cap-2 Maneuver	173	200	-	160	201	-	-	-	-	-	-	-
Stage 1	568	558	-	448	456	-	-	-	-	-	-	-
Stage 2	435	454	-	516	558	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	56	22.2	0.2	0.1
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1104	-	-	212	226	956	-	-
HCM Lane V/C Ratio	0.015	-	-	0.718	0.072	0.006	-	-
HCM Control Delay (s)	8.3	-	-	56	22.2	8.8	0	-
HCM Lane LOS	A	-	-	F	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	4.7	0.2	0	-	-